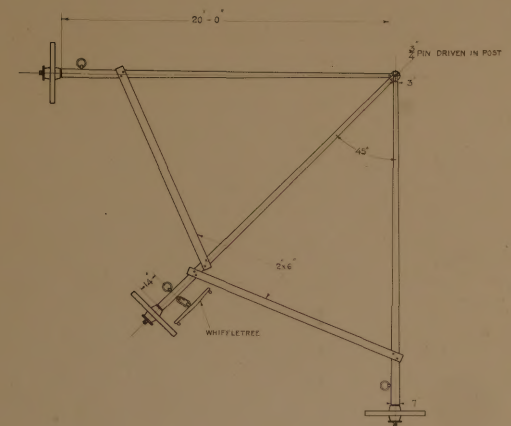
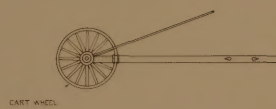
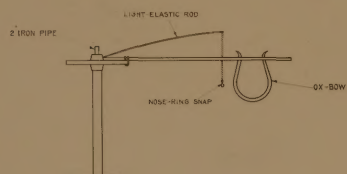


BULL EXERCISER FOR SEVERAL



CART WHEEL

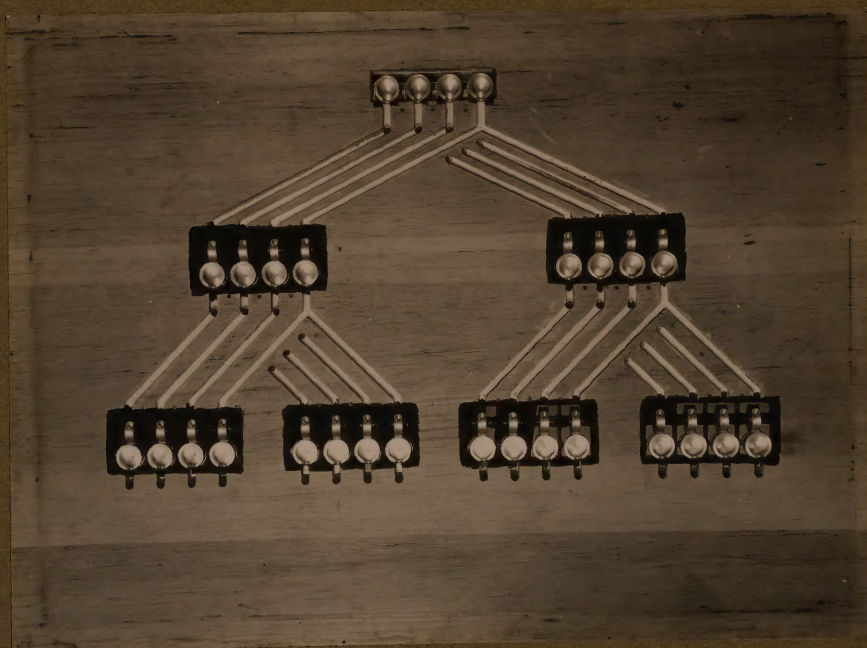


BULL EXERCISER FOR ONE

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF CATTLE INDUSTRY
DRAWN BY: H. E. A. SCALE: 1/4" = 1'-0"
CHECKED BY: W. E. B. APPROVED BY: _____



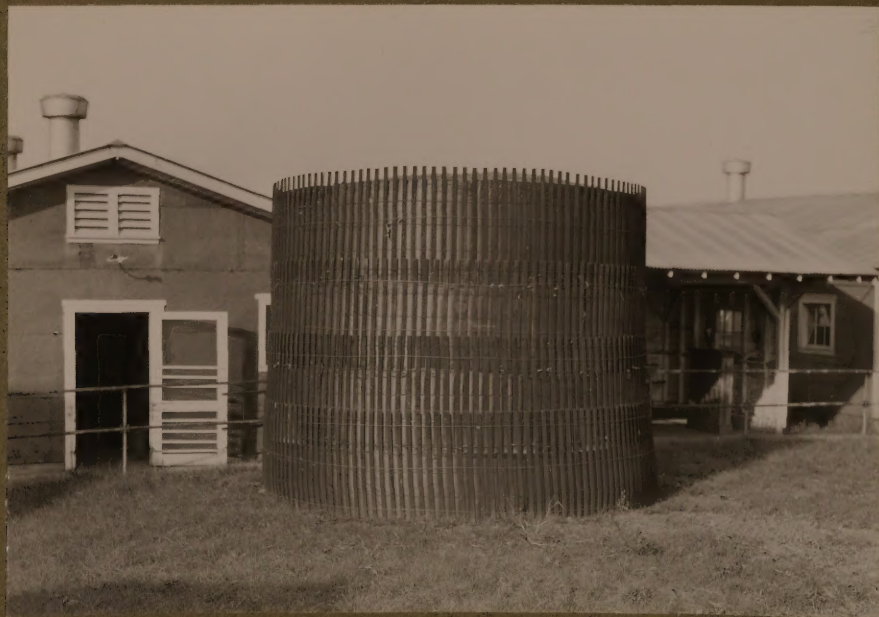
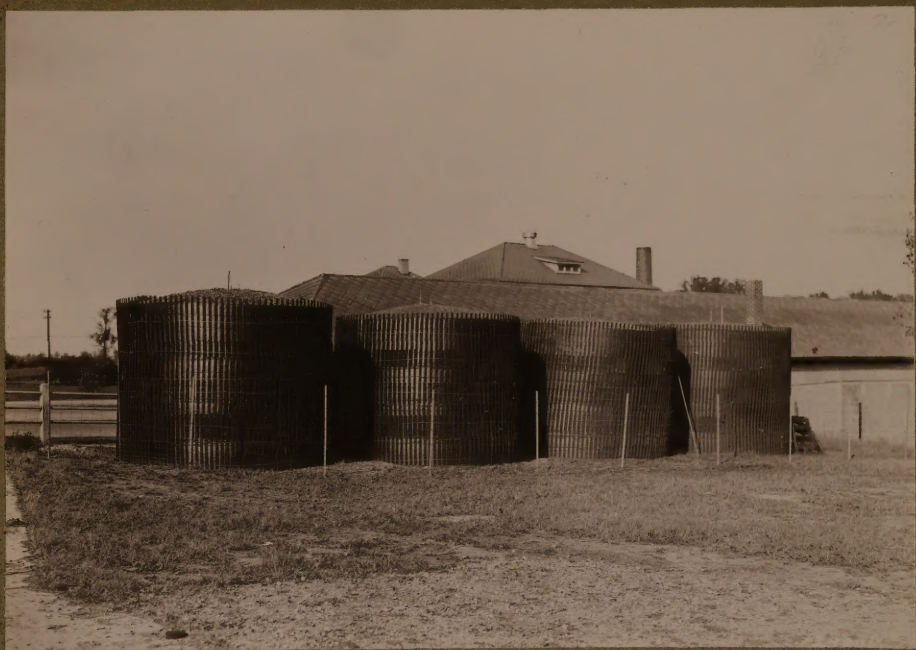
24665c



mounted up

10961





39002



M-2043









13345



14077



$\frac{1}{2}$ INCH PIPE
LENGTH 7 INCHES
HOLES $\frac{1}{4}$ INCH

15837



15836



15388



15387



15386



Cattle Show
Oct. 1930

16636



5 Daughters of Torono
4 " " " Moose
Oct. 1930

16634

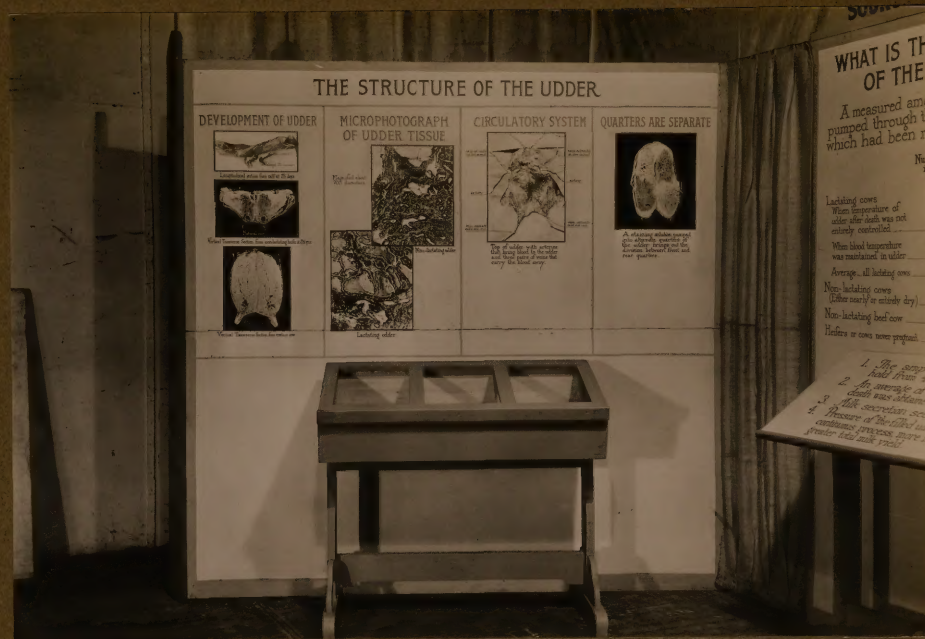


9 Drs. of Raqs
Oct. 1930

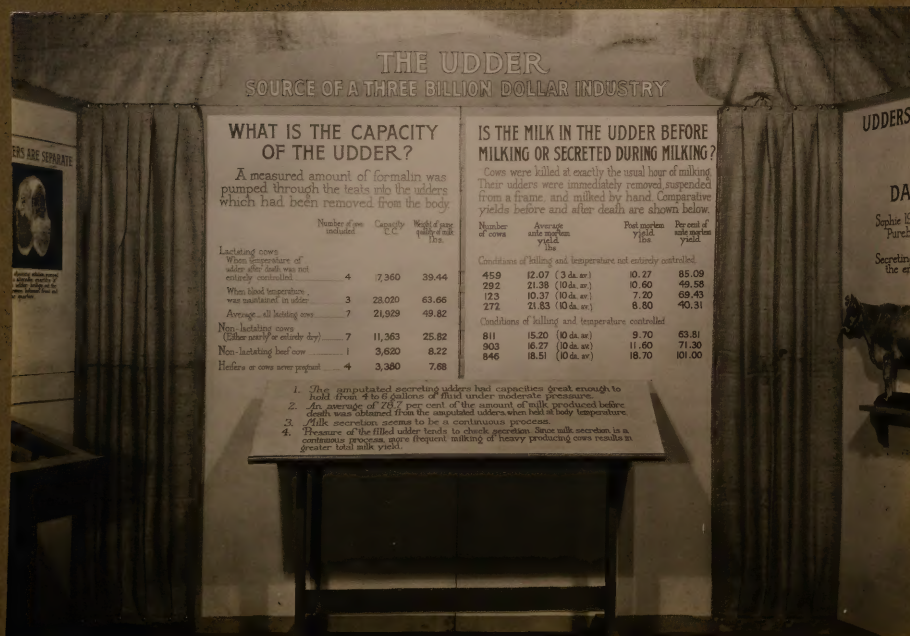
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11740



11738



11739



11737



Pumping up Udder
Sophie 19th of
Hood Farm
6-19-24



Pumping up Udder
Sophie 19th of
Hood Farm
6-19-24



Pumping up Udder
Sophie 19th of
Hood Farm
6-19-24





A.H. Neg. #28930-B

Shorthorn-Brahman Steer



A.H. Neg. #28931-B

Shorthorn-Brahman Steer





27502-C



M.1779



M 1773



M 1774



M 1777



M-1774



M-1775







29893



29894

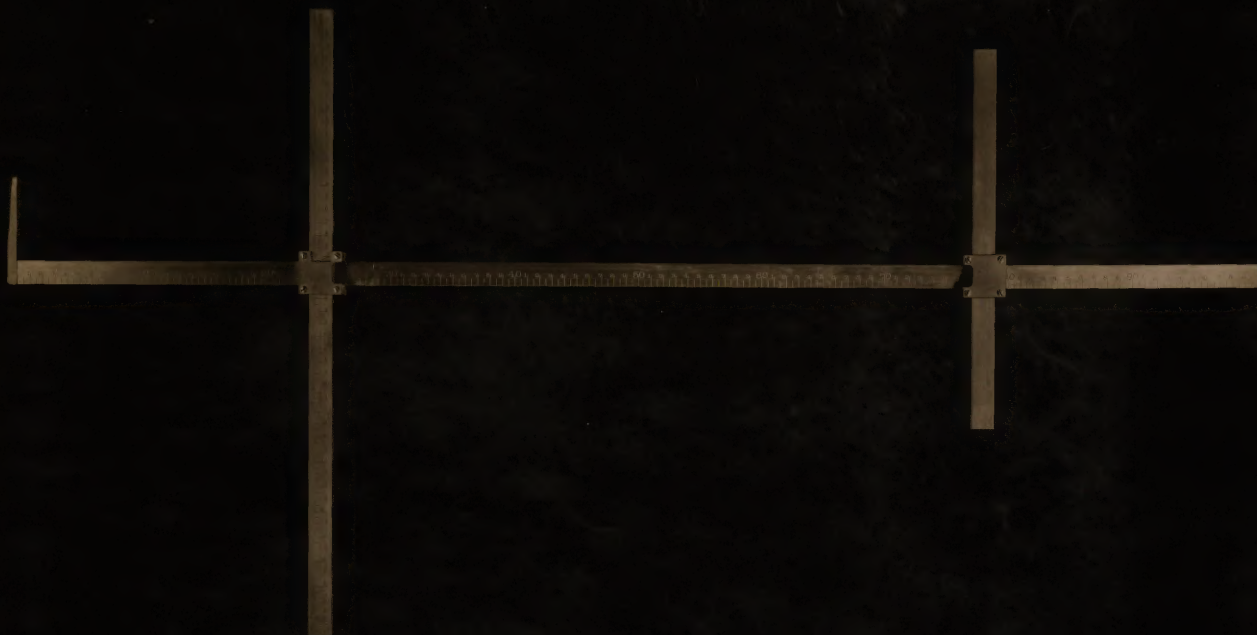


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29896





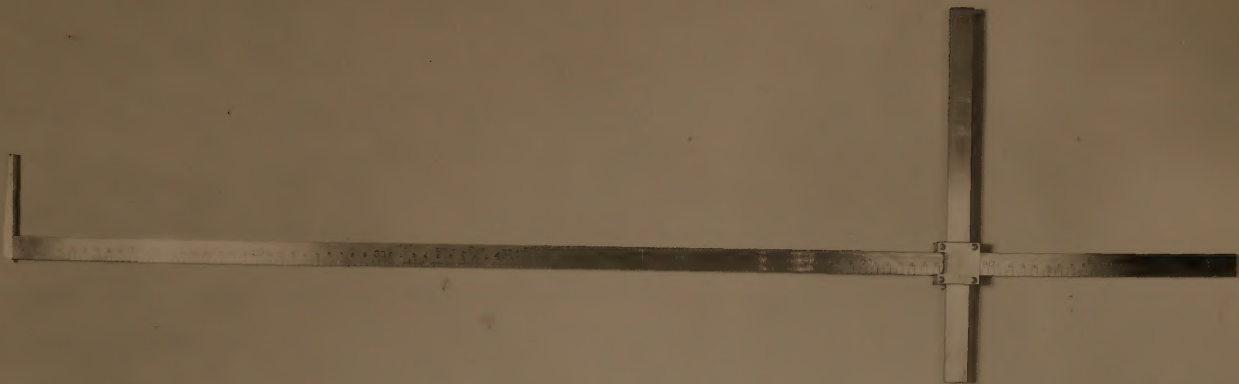
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No. 1*

X1768



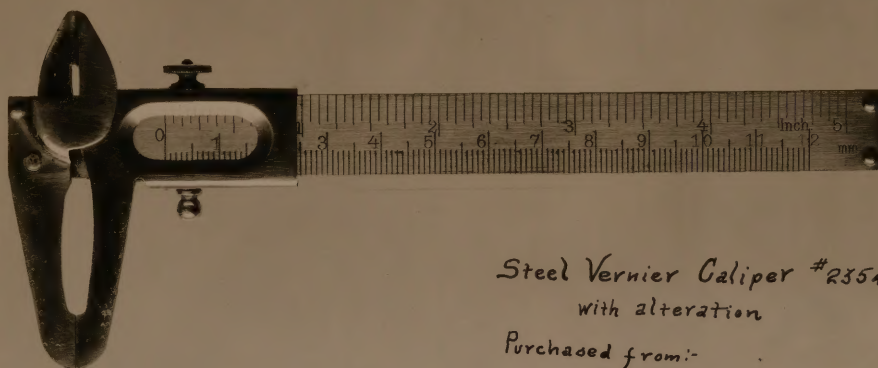
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X1767



Carcass Caliper
No. 3

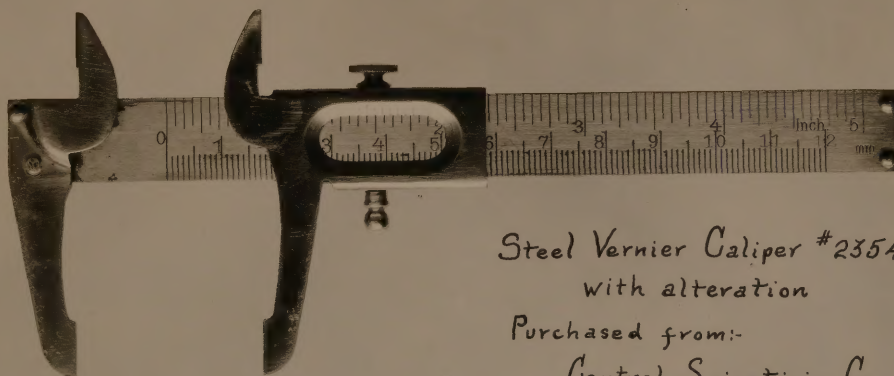
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Steel Vernier Caliper #2354
with alteration

Purchased from:-

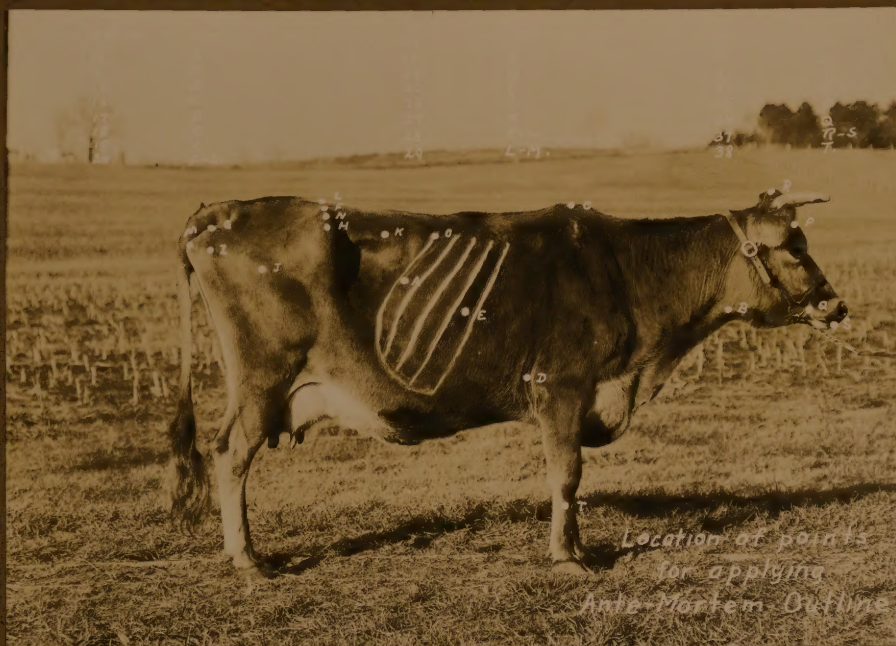
Central Scientific Co.
460 E. Ohio St.,
Chicago, Ill.



Steel Vernier Caliper #2354
with alteration

Purchased from:-

Central Scientific Co.,
460 E. Ohio St.,
Chicago, Ill.



Location of points
for applying
Amb-Marten Ointment

6973



Bovine Clinometer
8-13-25

8396







Horizontal Caliper



Bovine Clinometer



Vertical Standard



Vertical Caliper



Box for Controlling Temperature of
Udder in Post-Mortem Milking

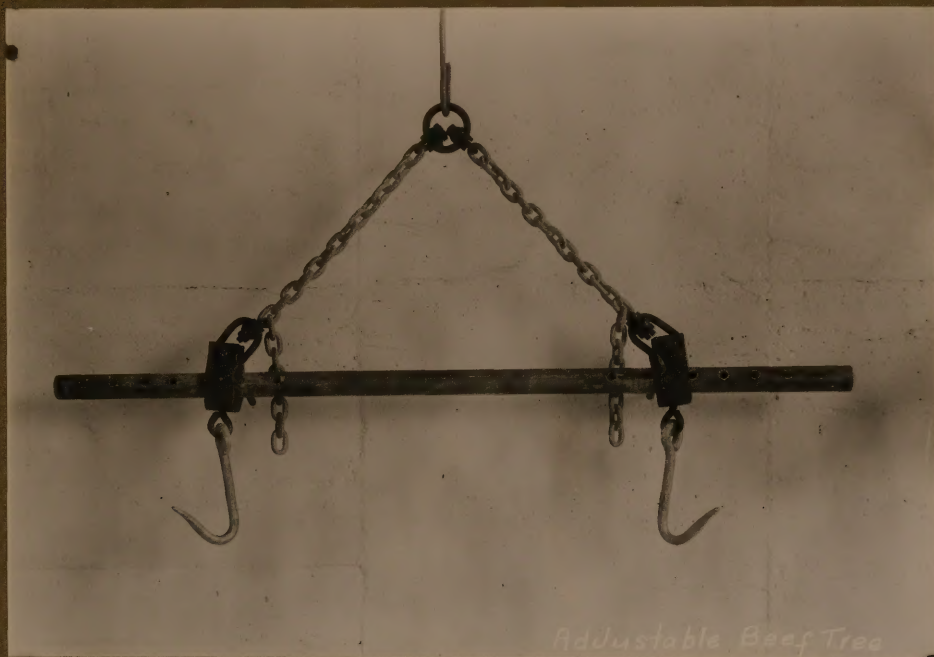


Box for Controlling Temperature of
Udder in Post-Mortem Milking



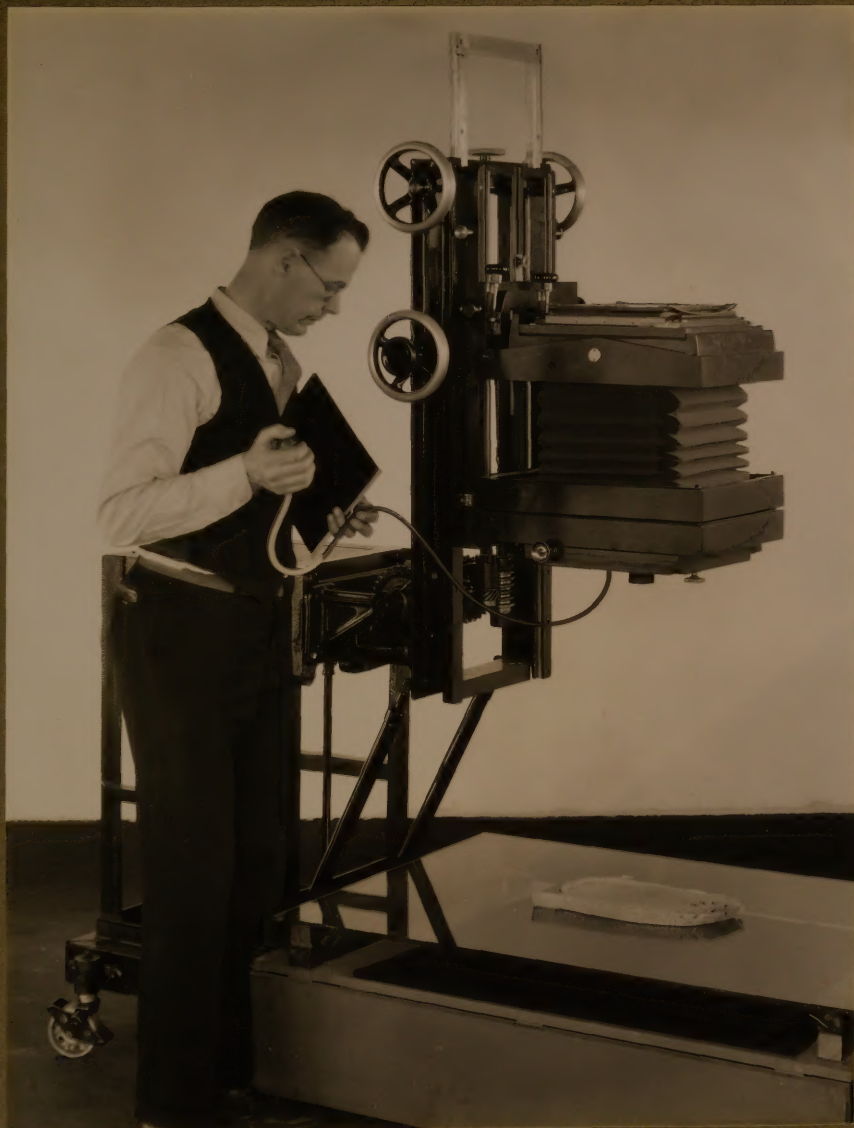
Adjustable Beef Tree

15401

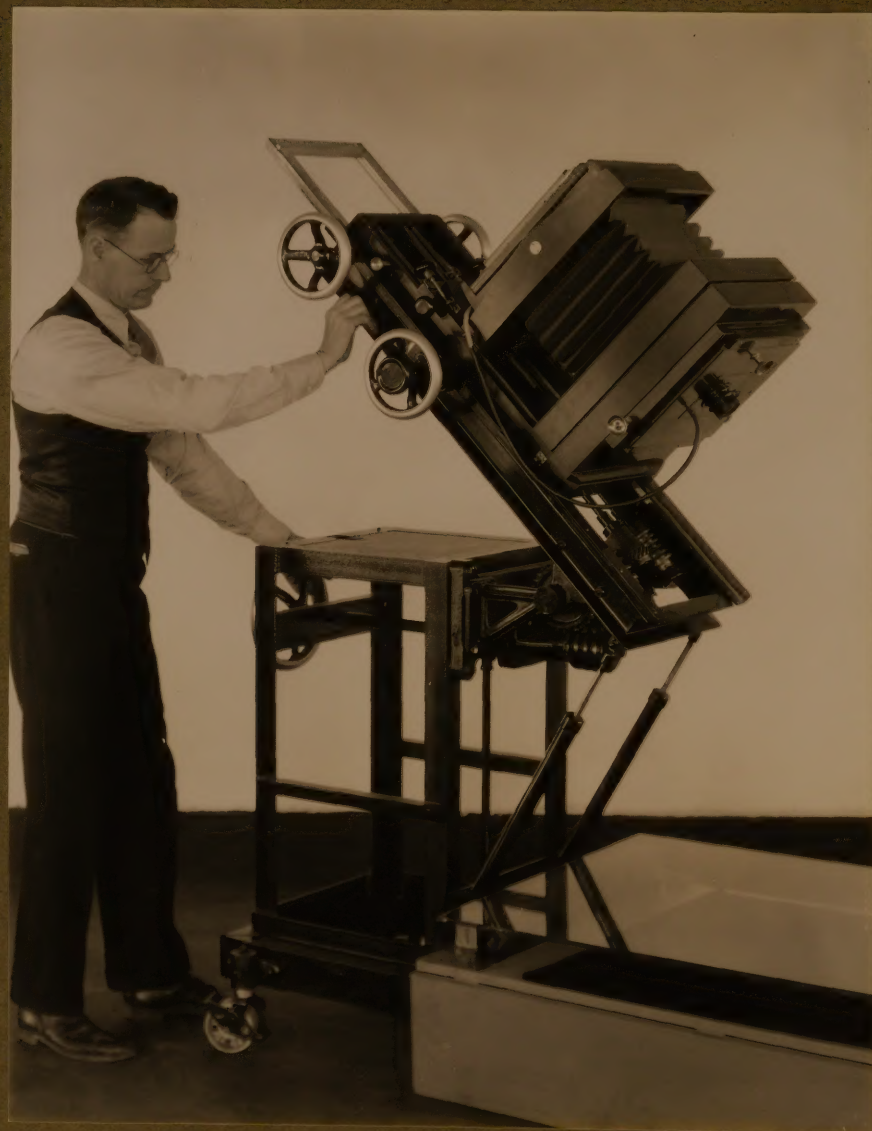


Adjustable Beef Tree

15400



27498-C



27499-C

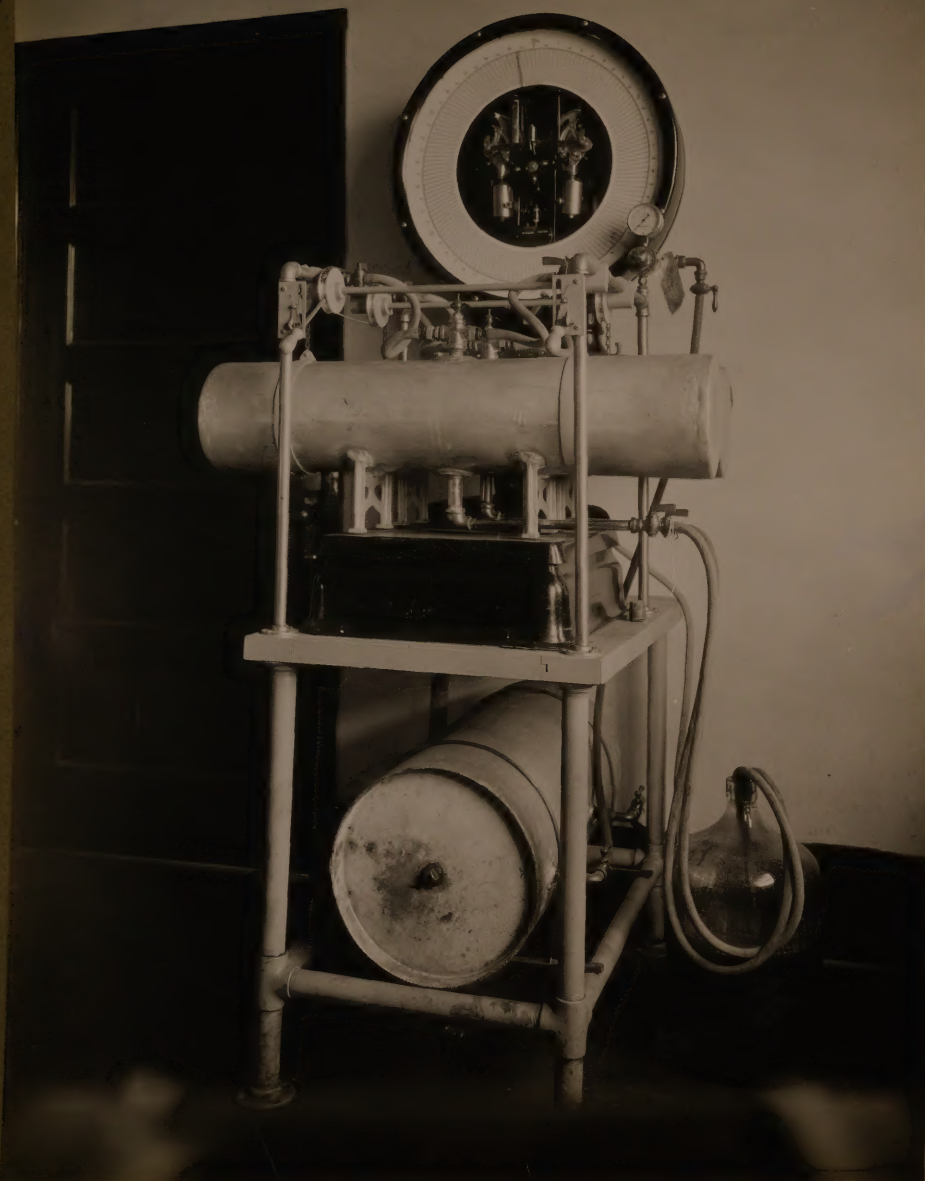


27501-C



27500-C

5817A

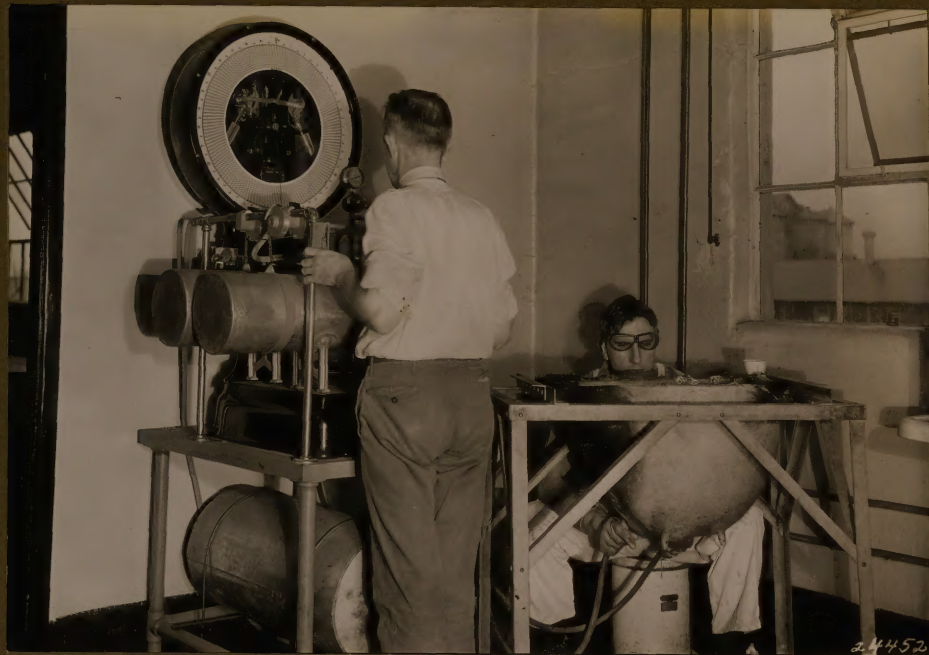


X4185

9317A



X4186



24452



24454



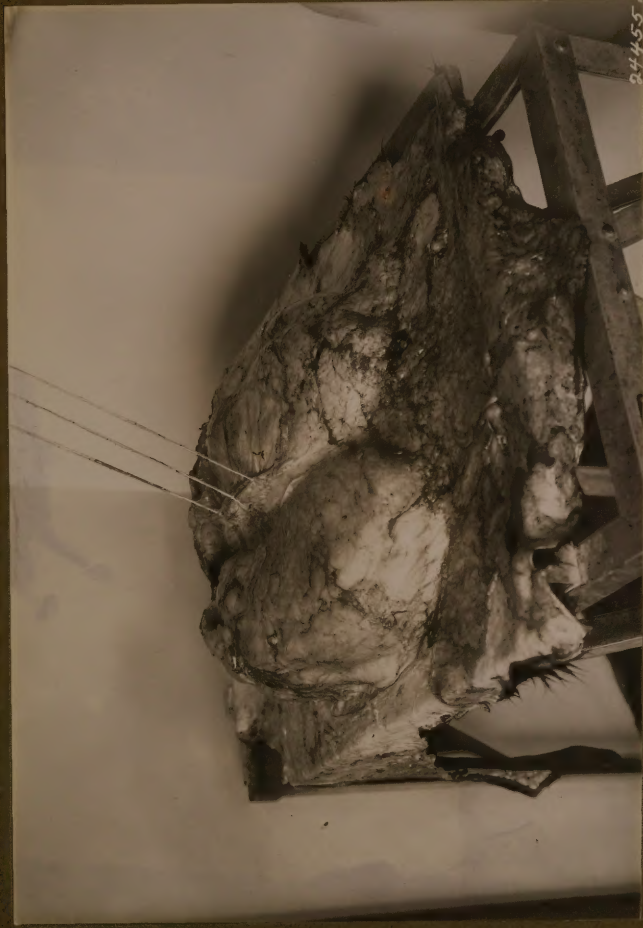
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24451



24449



24453

24456



24450

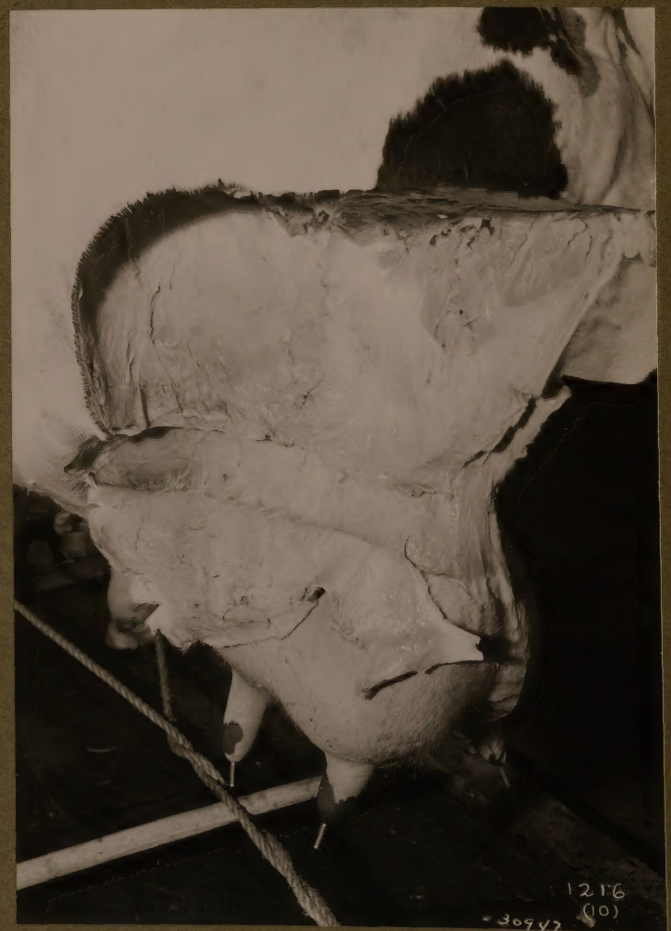
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30953





30957

1216
30957 (20)



30958

1216
30958 (21)



30959

1216
30959 (22)





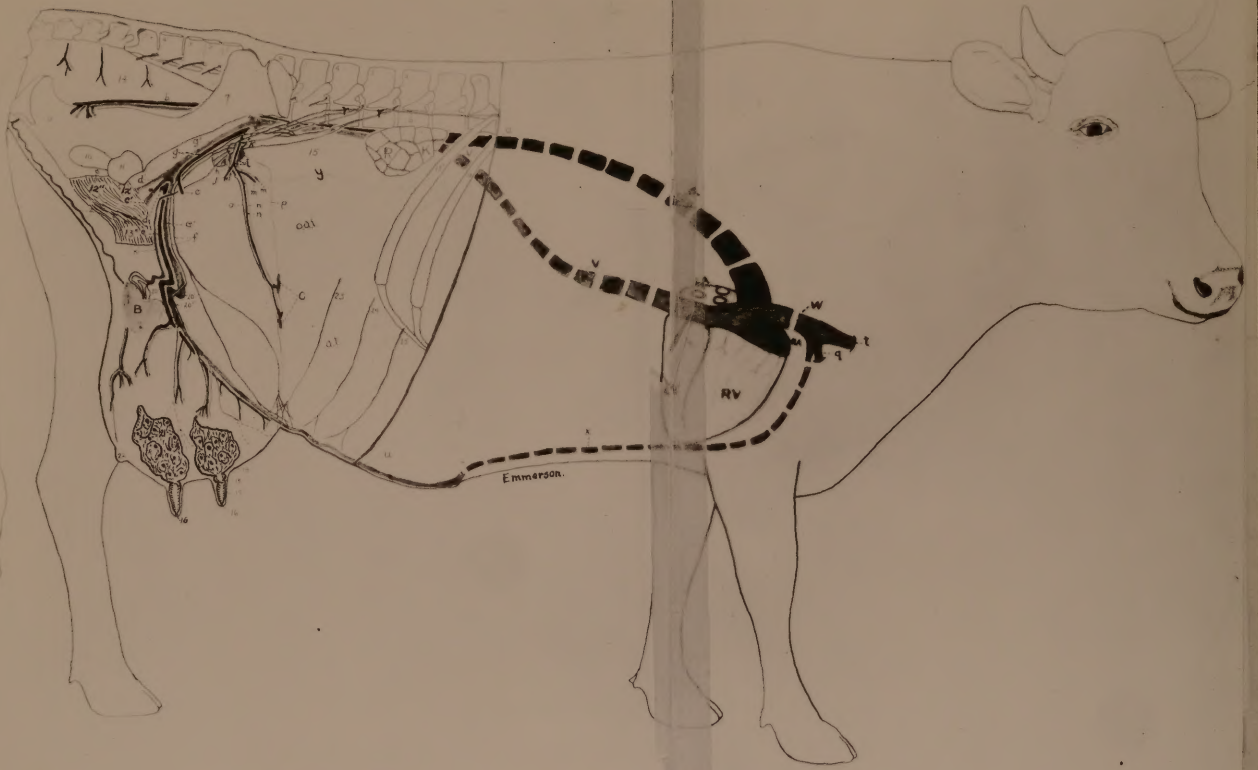
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32131



32132



X 5946



Figure 10.

X 5945



32132

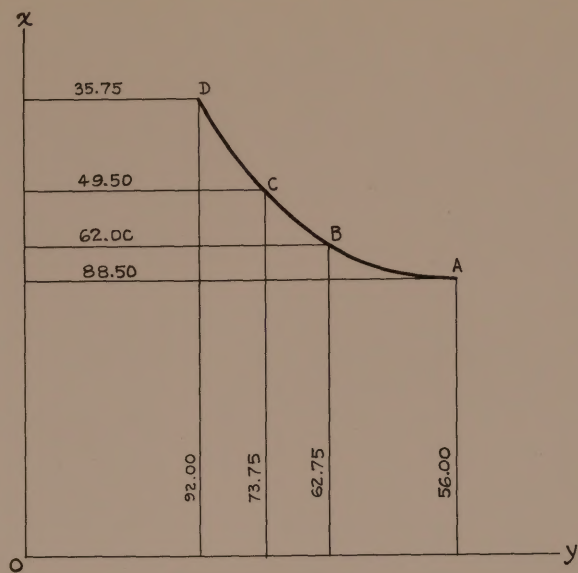


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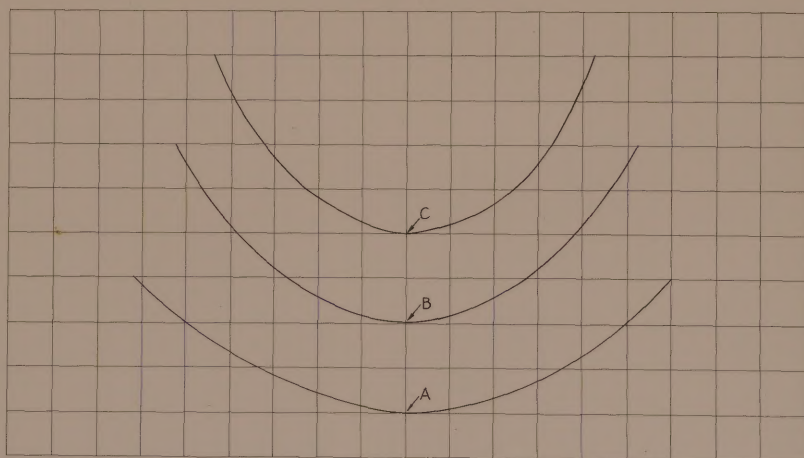


32128

mid value
of the interval
316



31627



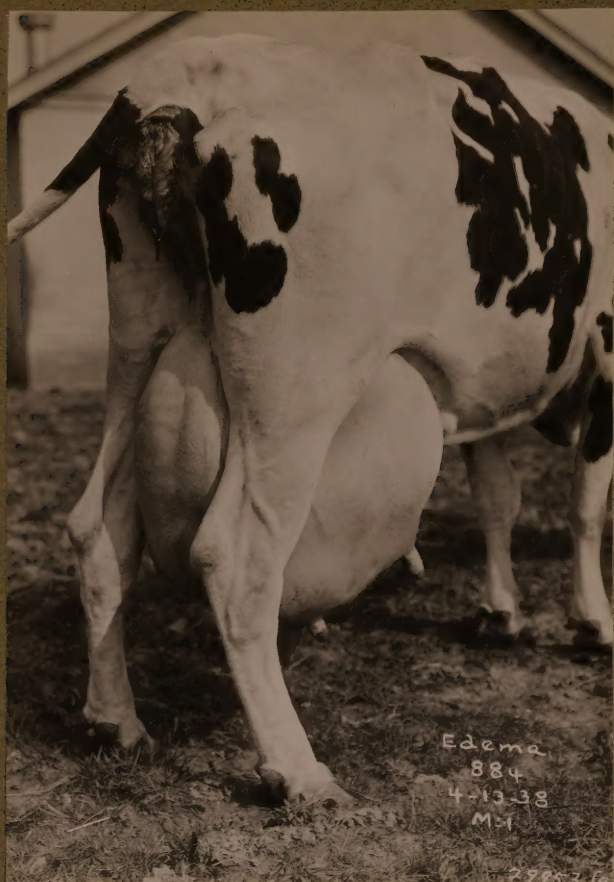
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29891



29892



29953 (b)



29051 a



18430 a



14853 a



24907 a



16390a



16537a



23747a



25289a



8848a



13842a



16574a



14035a



6435a



12762a



17589a



17110a



12761a



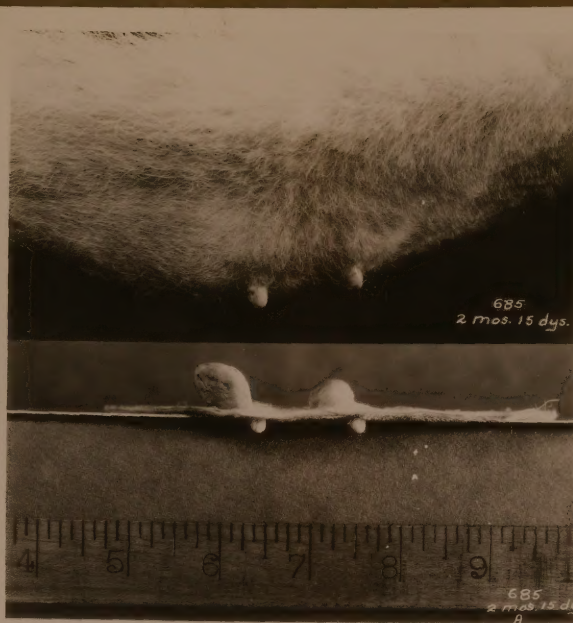
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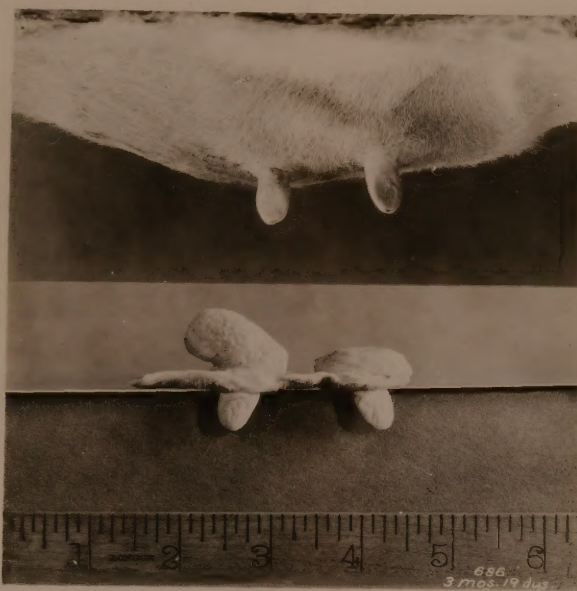
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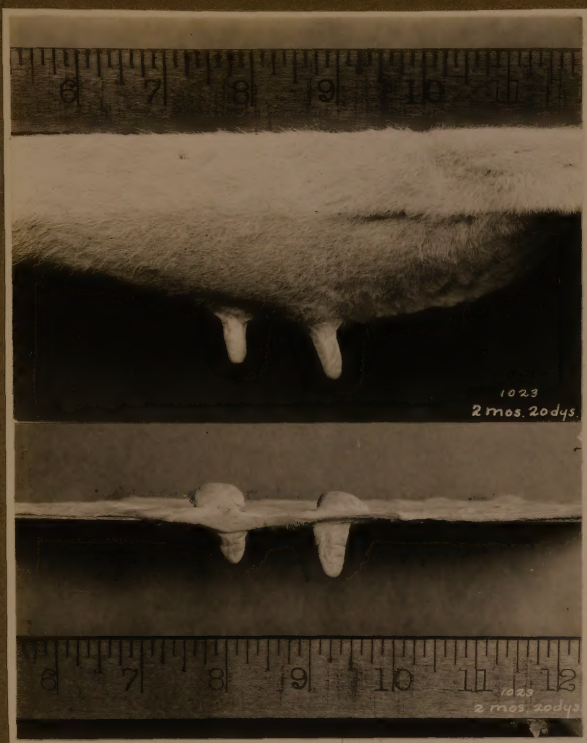
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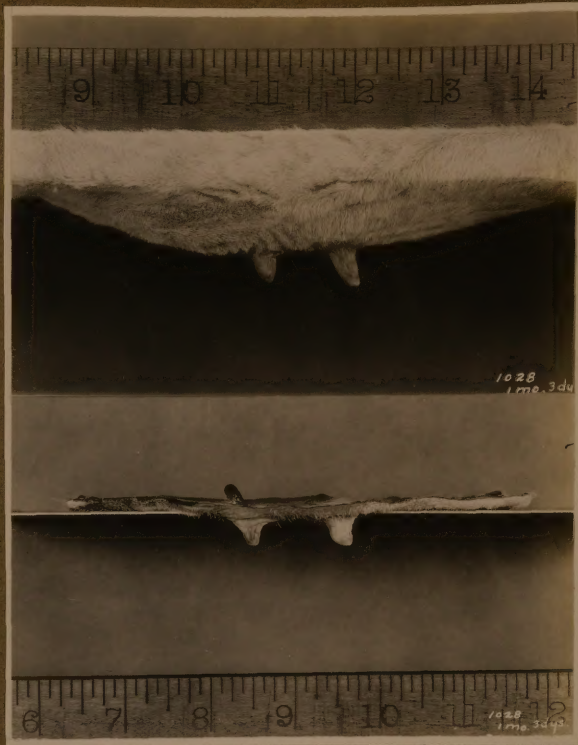
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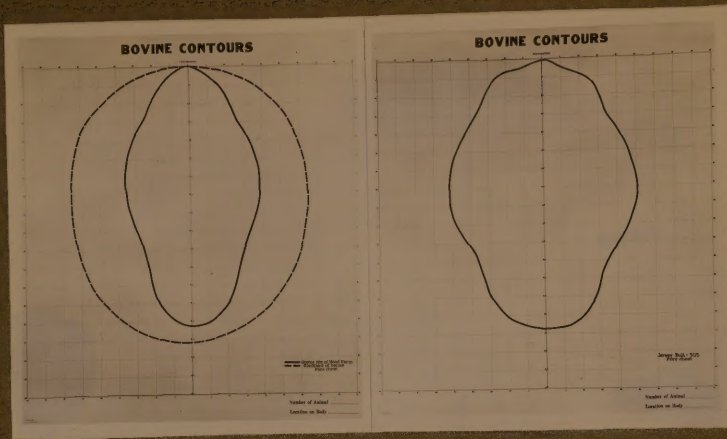
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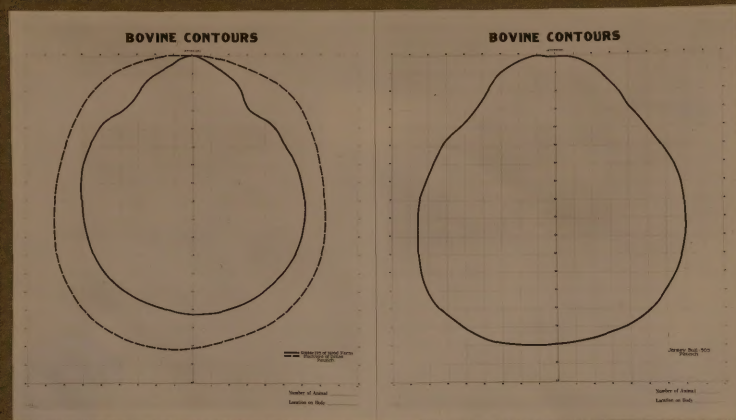
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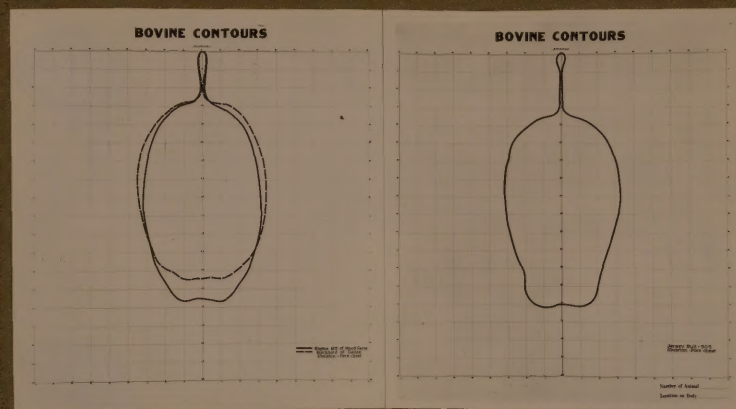
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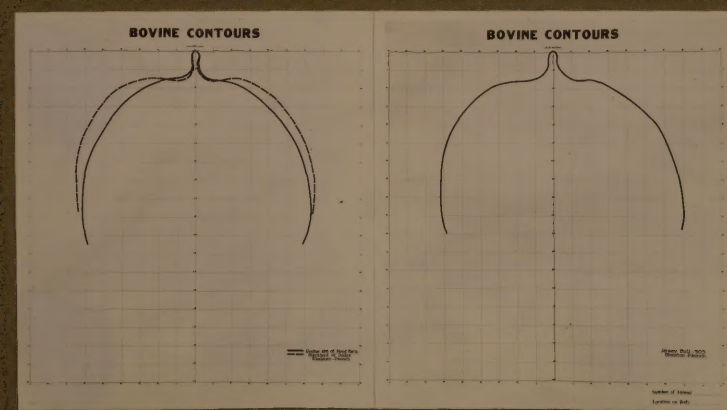
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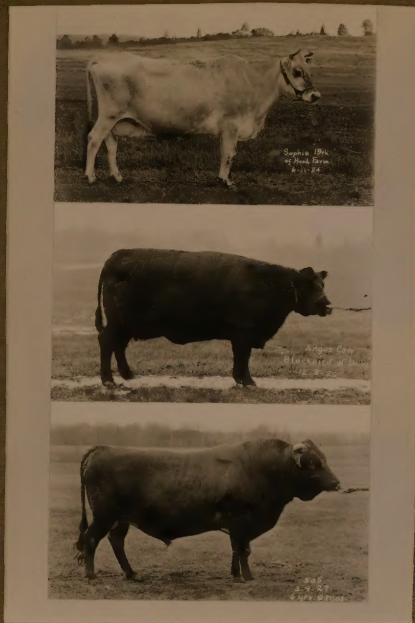
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15336



15340



15329



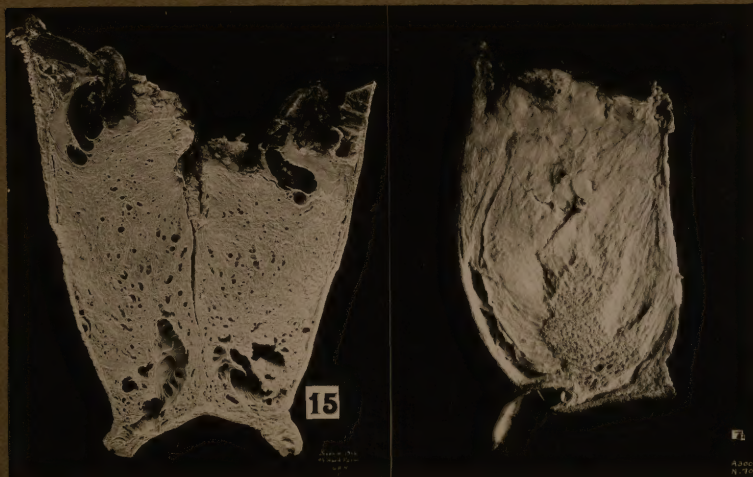
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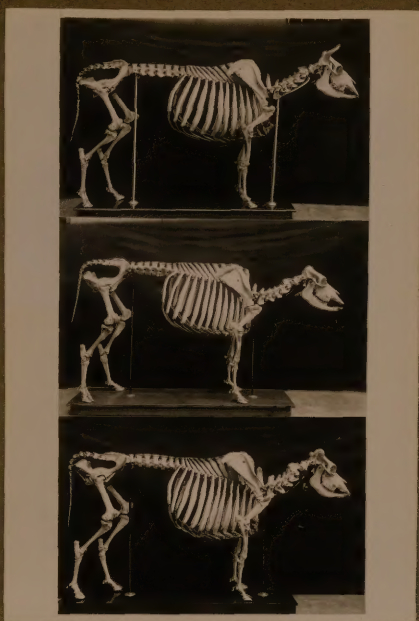
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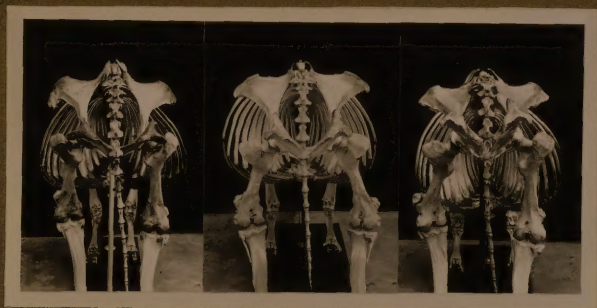
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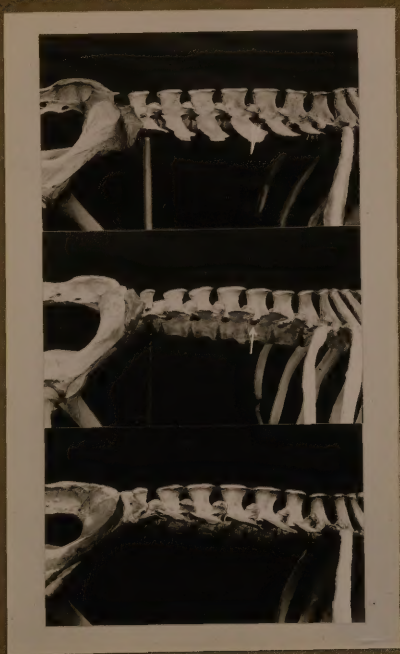
15328



15331



15332



15327



15336

RANGE OF VALUES SECURED WITHIN A BREED.

FIRST 38 ANIMALS SLAUGHTERED AT BELTSVILLE AND COOPERATING STATIONS.

ORGAN	MINIMUM	MAXIMUM	BREED IN WHICH FOUND	PER CENT VARIATION
Brain (wt.)	.49 lb.	1.02 lb.	Holstein	108%
Heart (wt.)	2.40 lb.	5.60 lb.	Ayrshire	133%
Lungs (wt.)	5.13 lb.	11.00 lb.	Jersey	114%
Stomachs (wt.)	19.00 lb.	47.00 lb.	Jersey	147%
Intestines (wt.)	20.70 lb.	46.50 lb.	Holstein	125%
Intestines (length)	129.00 ft.	212.00 ft.	Ayrshire	64%
Kidney (wt.)	2.20 lb.	5.56 lb.	Holstein	153%
Liver (wt.)	12.90 lb.	27.00 lb.	Holstein	109%

RANGE OF VALUES SECURED - ALL BREEDS COMBINED.

FIRST 38 ANIMALS SLAUGHTERED AT BELTSVILLE AND COOPERATING STATIONS.

ORGAN	MINIMUM	BREED IN WHICH FOUND	MAXIMUM	BREED IN WHICH FOUND	PER CENT VARIATION
Brain (wt.)	.49 lb.	Holstein	1.20 lb.	Jersey	145%
Heart (wt.)	2.40 lb.	Ayrshire	5.60 lb.	Ayrshire	133%
Lungs (wt.)	3.80 lb.	Ayrshire	13.00 lb.	Holstein	242%
Stomachs (wt.)	19.00 lb.	Jersey	51.50 lb.	Holstein	171%
Intestines (wt.)	17.20 lb.	Ayrshire	46.50 lb.	Holstein	170%
Intestines (length)	129.00 ft.	Ayrshire	237.55 ft.	Holstein	84%
Kidney (wt.)	1.68 lb.	Jersey	5.56 lb.	Holstein	241%
Liver (wt.)	6.75 lb.	Jersey	27.00 lb.	Holstein	300%

CAPACITY OF SECRETORY SYSTEM:

MAMMARY GLAND

Number	Capacity c.c.	Milk Equivalent pounds
Lactating Cows (Temperature Controlled):		
S. E. 846	27,600	62.70
S. E. 903	28,780	65.38
S. E. 811	27,680	62.68
	Aver.	63.55
Lactating Cows (Temperature not Controlled):		
459	12,400	28.17
292	20,400	46.35
123	15,320	34.81
272	21,320	48.44
	Aver.	39.44
Average of All Lactating Cows:		49.82
Cows Nearly or Entirely Dry:		
245	12,000	27.26
221-ext. fibrous	13,000	29.53
243	9,400	21.36
230-very fibrous	12,700	28.85
466	11,640	26.44
464-high quality	8,800	19.99
414-high quality	12,000	27.26
	Aver.	25.81
Dry Beef Cow:		
A-300	3,620	8.22
Heifers or Cows Never Pregnant:		
(Age-Yrs)		
1½	649	5,600
2½	621	5,180
4	489	1,600
6	453	1,140
	Aver.	7.58

POST MORTEM MILKING STUDIES.*

No. of Cow	Quantity of Milk Secured After Death.			Quantity of Milk Secured Before Death.	Per cent of A. M. Secured in P. M.	Capacity Udder. Est'd Right Basis Half	
	1st P.M.	2nd P.M.	Total P.M.	3 day Av.	3 day Av.	Volume cc.	Milk Equiv. lbs.
846	15.4	3.3	18.7	18.8	99.5	27,600	62.70
903	9.0	2.6	11.6	15.6	74.4	28,780	65.38
811	8.9	.8	9.7	14.3	67.8	27,680	62.88
	11.1	2.2	13.3	16.2	80.6	28,020	63.65

*Temperature of Udder Controlled.

COEFFICIENTS OF CORRELATION

PACKING HOUSE DATA

Relation of	: To Weight of Heart		: To Weight of Total Lungs	
Weight body	: .5092	.0310	: .3428	.0389
Surface Area	: .5029	.0312	: .4184	.0364
Circ. fore chest	: .4938	.0316	: .3718	.0380
Circ. rear chest	: .4835	.0321	: .3348	.0392
Depth rear chest	: .4569	.0331	: .4178	.0364
Volume Thoracic Cage	: .4391	.0358	: .4330	.0378
Depth fore chest	: .4364	.0339	: .4323	.0359
Max. Int. Depth Thoracic Cage	: .4265	.0361	: .3829	.0396
Max. Int. Length Thoracic Cage	: .4096	.0368	: .3998	.0390
Height withers	: .3637	.0363	: .3028	.0401
Weight blood	: .3479	.0368	: .2643	.0410
Max. Int. Width Thoracic Cage	: .3213	.0396	: .3019	.0422
Width rear chest	: .2889	.0383	: .2119	.0421
Width fore chest	: .2762	.0387	: .1996	.0423
Legginess	: -.0941	.0415	: -.1289	.0434

POST MORTEM MILKING STUDIES.*

No. of Cow	Quantity of Milk Secured After Death.			Quantity of Milk Secured Before Death.	Per cent of A. M. Secured in P. M.	Capacity Udder. Estimated on Basis of Right Half.	
	1st P.M.	2nd P.M.	Total P.M.			Volume cc.	Milk Equiv. lbs.
459	9.20	1.07	10.27	12.07	85.09	12,400	28.17
292	7.70	2.90	10.60	21.38	49.58	20,400	46.35
123	5.90	1.30	7.20	10.37	69.43	15,320	34.81
272	6.50	2.30	8.80	21.83	40.31	21,320	48.44
	7.33	1.89	9.22	16.41	61.10	17,360	39.44

* Conditions of Killing and Temperature of Udder not Entirely Controlled.

X11306

POST MORTEM MILKING STUDIES.

Number of Cow	Quantity of Milk Obtained Ante Mortem	Quantity of Milk Obtained Post Mortem.			Per cent of Ante Mortem Obtained Post Mortem
	10 Day Average	First Post Mortem	Second Post Mortem	Total Post Mortem	
459	12.07*	9.20	1.07	10.27	85.09
292	21.38	7.70	2.90	10.60	49.58
123	10.37	5.90	1.30	7.20	69.43
272	21.83	6.50	2.30	8.80	40.31
Average	16.41			9.22	61.10
846	18.51	15.40	3.30	18.70	101.03
903	16.27	9.00	2.60	11.60	71.30
811	15.20	8.90	.80	9.70	63.82
257	24.73	12.10	3.25	15.35	62.07
253	21.25	12.55	2.90	15.45	72.71
443	17.41	11.85	3.35	15.20	87.31
Average	18.90			14.33	76.37

*3 day average

12607

CAPACITY OF SECRETORY SYSTEM OF
MAMMARY GLAND

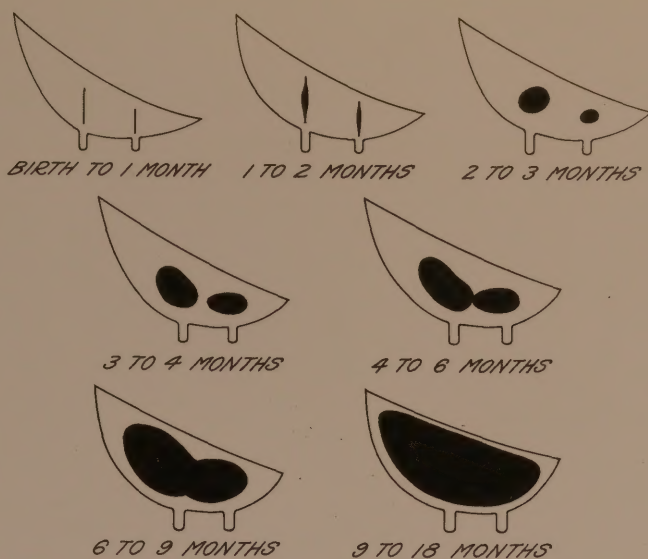
	Number of Animals	Capacity c.c.	Milk Equivalent pounds
Lactating	14	19,193	43.60
Nonlactating	8	12,236	27.80
Nonlactating Beef Cow	1	3,620	8.22
Heifers or Cows Never Pregnant	6	4,190	9.52
Calves Under Four Months	2	212	.49

12608

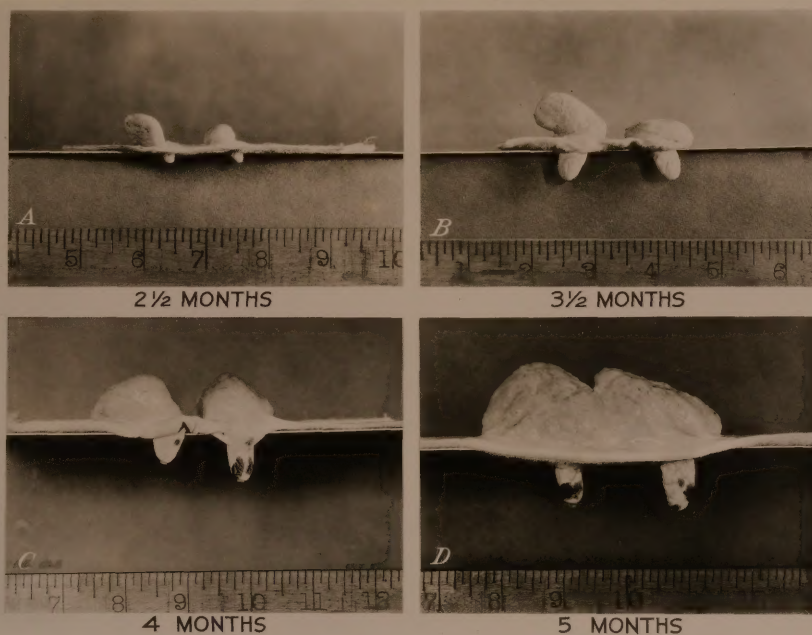
TABLE 1.—Percentage of total number of calves represented in each stage of mammary-gland development, and dimensions of the glandular tissue at different ages

Age group	Straight-tube stage	En-lar-gement stage	Quarter stage			Half stage			
			Per-cent	Width, front	Width, rear	Per-cent	Length	Width, front	Width, rear
Holsteins:	Percent	Percent		Inches	Inches		Inches	Inches	Inches
14 days.....	100	6							
1 month.....	99	7	2	0.22	0.27				
2 months.....	62	29	49	.33	.37				
3 months.....	17	9	78	.44	.52	17	1.79	0.63	0.72
4 months.....	5	4	44	.56	.66	55	2.33	.77	.83
5 months.....			19	.63	.80	81	2.78	.93	.94
6 months.....			6	.63	.88	95	3.33	1.04	1.04
9 months.....						92	4.73	1.29	1.22
12 months.....						100	5.56	1.40	1.32
18 months.....						99	7.09	1.45	1.35
Jerseys:									
14 days.....	100	8							
1 month.....	99	9	2	.50	.50				
2 months.....	56	31	53	.31	.36	3	1.50	.47	.47
3 months.....	12	7	66	.45	.53	32	1.77	.64	.67
4 months.....	2	1	31	.51	.59	74	2.23	.75	.78
5 months.....			7	.60	.72	94	2.78	.86	.86
6 months.....						100	3.35	.99	.98
9 months.....						99	4.73	1.19	1.15
12 months.....						100	5.83	1.32	1.26
18 months.....						100	8.26	1.47	1.41

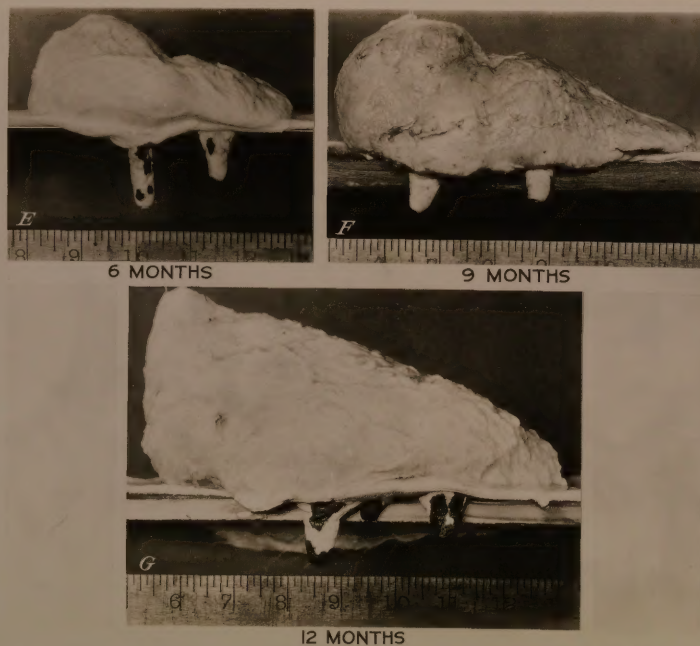
Slides



22589



22591



22590

Percentage of Total Number of Calves Represented in Each Stage of Development, and the Dimensions of Glandular Tissue at Different Ages.

Age group	Straight tube stage	Enlarge-ment stage	Quarter Stage			Half Stage			
			Width front	Width rear	Length	Width front	Width rear		
	Per cent	Per cent	Per cent	Inches		Inches	Per cent	Inches	Inches
				<u>HOLSTEINS</u>					
14 days	100	6							
1 month	99	7	2	.22	.27				
2 months	62	29	49	.33	.37				
3 months	17	9	78	.44	.52	17	1.79	.63	.72
4 months	5	4	44	.56	.66	55	2.33	.77	.83
5 months			19	.63	.80	81	2.78	.93	.94
6 months			6	.63	.88	95	3.33	1.04	1.04
9 months						92	4.73	1.29	1.22
12 months						100	5.56	1.40	1.32
18 months						99	7.09	1.45	1.35

Percentage of Total Number of Calves Represented in Each Stage of Development, and the Dimensions of Glandular Tissue at Different Ages.

Age group	Straight tube stage Per cent	Enlarge-ment Per cent	Quarter Stage			Half Stage			
			Per cent	Width front	Width rear	Per cent	Length	Width front	Width rear
				Inches	Inches		Inches	Inches	Inches
JERSEYS									
14 days	100	8							
1 month	99	9	2	.50	.50				
2 months	56	31	53	.31	.36	3	1.50	.47	.47
3 months	12	7	66	.45	.53	32	1.77	.64	.67
4 months	2	1	31	.51	.59	74	2.23	.75	.78
5 months			7	.60	.72	94	2.78	.86	.86
6 months						100	3.35	.99	.98
9 months						99	4.73	1.19	1.15
12 months						100	5.83	1.32	1.26
18 months						100	8.26	1.47	1.41

22592

TABLE 1.—Quantity of milk obtained before death of the cow and after death and amputation of the udder

[Cows in Group 1 felled by a blow on the head and udders permitted to become chilled after death; cows in Group 2 shot and udders held at blood temperature]

Group and cow No.	Average production for 10 days, ante-mortem milking	Milk from first post-mortem milking	Milk from second post-mortem milking	Total post-mortem milk	Percentage of ante-mortem production obtained in post-mortem milkings
Group 1:	Pounds	Pounds*	Pounds	Pounds	
459	12.07	9.20	1.07	10.27	85.09
292	21.38	7.70	2.90	10.60	49.58
123	10.37	5.90	1.30	7.20	69.43
272	21.83	6.50	2.30	8.80	40.31
Average	16.41	7.33	1.89	9.22	61.10
Group 2:					
846	18.51	15.40	3.30	18.70	101.03
903	16.27	9.00	2.60	11.60	71.30
811	15.20	8.90	.80	9.70	63.82
257	24.73	12.10	3.25	15.35	62.07
253	21.25	12.55	2.90	15.45	72.71
443	17.41	11.85	3.35	15.20	87.31
255	25.80	16.15	1.65	17.80	68.99
Average	19.88	12.28	2.55	14.83	75.32
Average for Groups 1 and 2	18.62	10.48	2.31	12.79	70.15

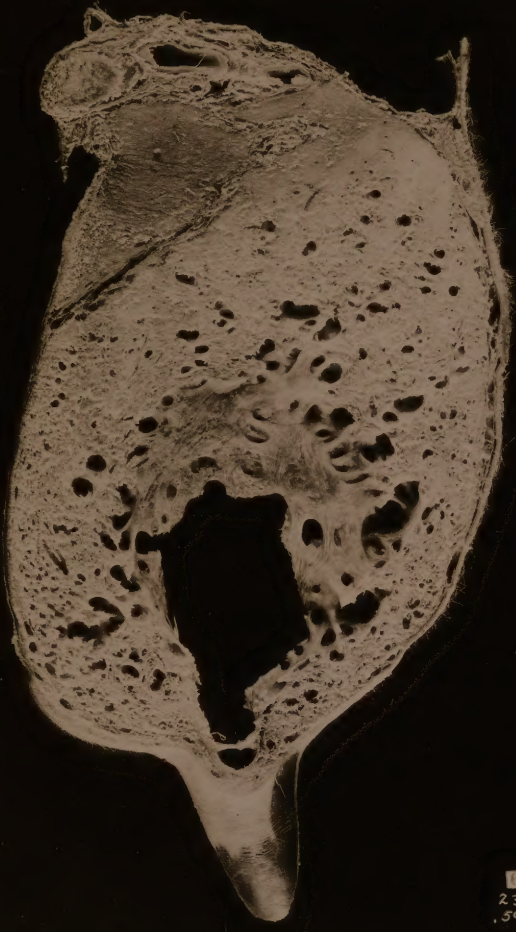
* 3-day average.

Table of Udder Capacities.

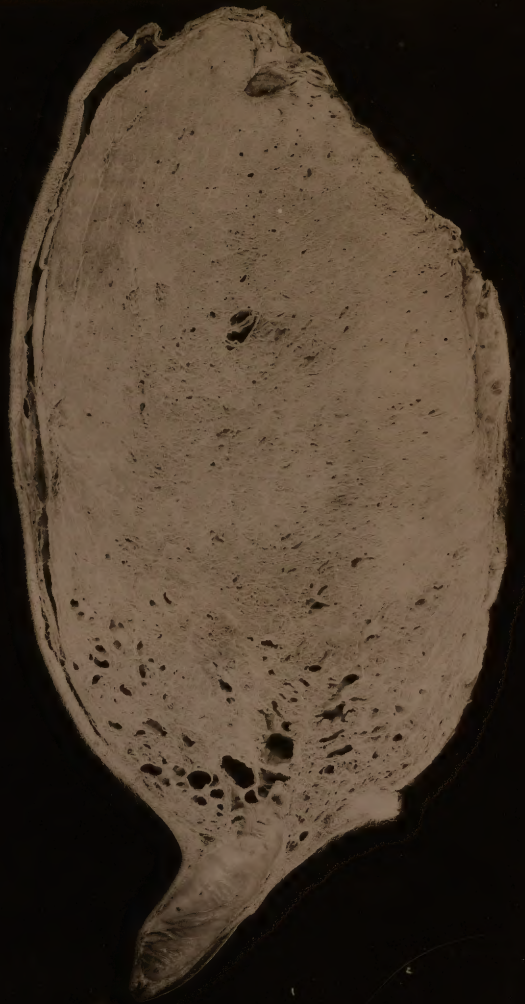
(to 6-30-33.)

Class of Animal	No. of animals included	Average capacity of udder (pounds)
Lactating Holsteins	35	49.45
Non-Lactating Holsteins	17	34.63
Lactating Jerseys	24	35.46
Non-Lactating Jerseys	39	24.52
Heifers or cows never pregnant	18	9.17
Free martins	6	3.08
Calves and Heifers:		
Above 24 months	10	10.27
18½ to 24½ "	3	7.07
12½ to 18½ "	5	8.18
9½ to 12½ "	4	4.86
6½ to 9½ "	4	1.92
3½ to 6½ "	5	.36
Birth to 3½ "	21	.06
Amberdeen Angus Cow (non lactating)	1	8.23
Hereford Cows (non lactating)	7	6.10
Ewes	2	2.56





230
.59 N.



X1763

Variation in Conformation and Anatomy. (Swift)

Organ or part	Minimum	Maximum	Average	Per cent variation.
Weight of body	660	1,510	1,059.7	128.7
Total length body	126.0	162.0	144.0	28.5
Height withers	115.0	143.5	129.0	24.7
Depth chest	64.0	85.0	72.6	32.8
Width chest	33.0	52.5	41.5	59.1
Circumference chest	162.0	212.0	186.4	30.8
Depth paunch	59.5	84.5	72.8	42.0
Width paunch	39.5	71.5	57.9	81.0
Circumference paunch	174.0	247.0	211.6	41.9
Weight blood	24.0	76.0	40.7	216.6
Weight brain	8.12 oz.	20.0	15.6	146.3
Weight pituitary	.06	.38	.14	533.3
Weight total lung	3.19	13.25	7.36	315.3
Weight heart	2.81	5.94	4.42	111.3
Weight liver	8.12	19.0	12.9	133.9
Length small intestine	70.0 ft.	160.0 ft.	107.1 ft.	128.5
Length large intestine	24.0 ft.	42.5 ft.	32.1 ft.	76.3
Weight spleen	.94 lb.	3.06	1.75	225.5
Weight pancreas	1.00 oz	17.62	7.46	1,662.0

Variation in Anatomy. (Beltsville)

Organ or part.	Minimum		Maximum		Average	Per cent variation over minimum	
						Jersey.	Holstein.
						Jersey.	Holstein.
Live weight	449 lbs.	1025	960	1511	774.9	1184.8	116.0 47.4
Weight blood	21.0 "	38.5	35.5	61.0	26.9	51.6	69.0 58.4
Weight liver	6. " 12 oz.	13-5	15-0	14-14	11-2	14-0.8	122.2 11.7
Weight supra-mammaries	44 gm.	115.0	158 gm.	425.3	90.3	276.91	259.1 269.7
Length total intestines	134.0 ft.	161.0	199.5	204.0	159.9	189.3	48.9 26.7
Weight lungs	5 lb.2 oz.	7-4	8-8	10-0	6-6.8	8.11	65.9 35.1
Weight heart	2 lb.14 oz	3-13	4-1	5-8	3-6.3	4-9.6	34.3 44.2
Circumference of heart (base)	38 cm	40	48	51	43.0	47	26.3 27.5
Circumference of heart (apex)	45 cm	49	51	61	48.5	54	13.3 24.5
Weight brain	13 oz.	13.5	17	15	14.5	14.2	30.8 11.1
Weight pituitary	3 gm.	3.5	5	6.0	4.0	4.5	66.7 71.4

Data are on 8 Jerseys and 5 Holsteins. A few are missing and some organs are not included because they were obviously abnormal on account of infection, etc.

Length of intestine



No. 437 - 199.5 ft.



No. 434 - 134 ft.

GROUP 1



459



292



123



272

GROUP 2



846



903



811



257



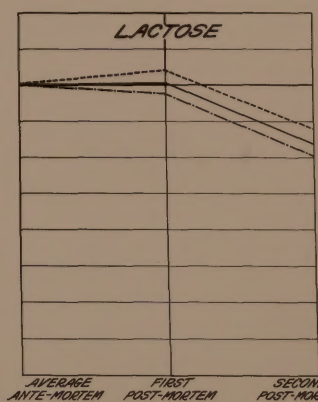
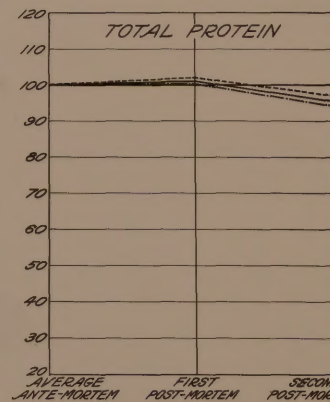
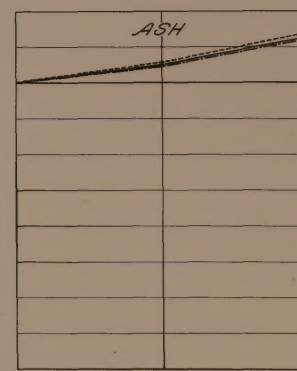
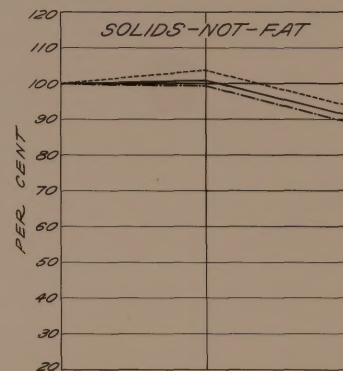
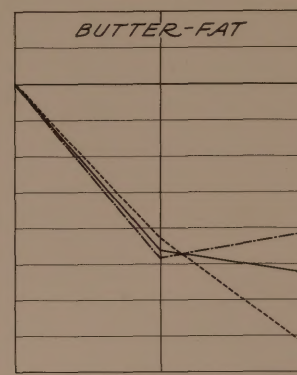
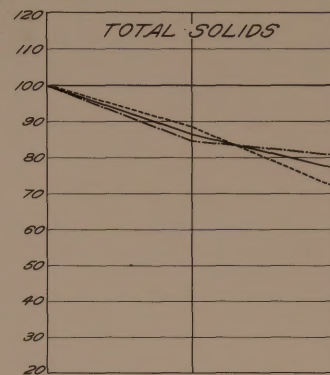
253



443



255



STANDARD FOR MAMMARY DEVELOPMENT HOLSTEINS.

	Age (a)	Straight tubes		Quarters				Halves				General Development			
		Number of tubes	Number of enlargements	Number	Width		Number	Length (1)	Width		Number approaching	Number joined	Size of depression (c)		
					Front (b)	Rear (b)			Front (b)	Rear (b)					
Average	0-14	4.00	2.25												
Minimum	0-1	4.00	1.00												
Maximum	0-22	4.00	4.00												
Frequency (c)	71														
% Frequency (d)	100.00	100.00	5.63												
Average	1-1	3.96	3.17	3.00	.22	.27									
Minimum	0-16	1.00	1.00	2.00	.22	.22									
Maximum	1-17	4.00	4.00	4.00	.22	.31									
Frequency (c)	80		6	2		1									
% Frequency (d)	98.77		7.41	2.47	1.23	2.47									
Average	2-0	3.75	3.17	3.87	.33	.37									
Minimum	1-16	1.00	1.00	2.00	.13	.23									
Maximum	2-8	4.00	4.00	4.00	.60	.63									
Frequency (c)	79		23	39	36	37									
% Frequency (d)	100.00	62.03	29.11	49.37	45.57	46.84									
Average	3-0	2.69	2.13	3.81	.44	.52	1.94	1.79	.63	.72	13	9	7.00		
Minimum	2-15	1.00	1.00	1.00	.15	.25	1.00	1.33	.42	.59			5.00		
Maximum	3-13	4.00	4.00	4.00	.67	.75	2.00	2.25	.79	.96			8.00		
Frequency (c)	93		8	73	63	67	16	15	15	15	13	9	12		
% Frequency (d)	100.00	17.20	8.60	78.49	67.74	72.04	17.20	16.13	16.13	16.13	13.98	9.68	12.90		
Average	4-0	3.20	2.25	3.86	.56	.66	1.98	2.33	.77	.83	16	42	6.94		
Minimum	3-17	2.00	1.00	2.00	.23	.32	1.00	1.50	.46	.63			4.00		
Maximum	4-12	4.00	4.00	4.00	.96	1.00	2.00	3.08	1.13	1.09			8.00		
Frequency (c)	97		4	43	35	42	53	52	52	52	16	42	49		
% Frequency (d)	100.00	5.15	4.12	44.33	36.08	43.30	54.64	53.61	53.61	53.61	16.49	43.30	50.52		
Average	5-0	4.00	.63	4.00	.80	.80	2.00	2.78	.93	.94	16	59	6.31		
Minimum	4-16	4.00	.36	4.00	.56	.56	2.00	1.83	.54	.63			2.00		
Maximum	5-17	4.00	.79	4.00	.98	.98	2.00	4.50	1.33	1.33			8.00		
Frequency (c)	94		18	13	17	17	76	76	76	76	16	59	62		
% Frequency (d)	100.00			19.15	13.83	18.09	80.85	80.85	80.85	80.85	17.02	62.77	65.96		
Average	6-0	4.00	.63	4.00	.88	.88	2.00	3.33	1.04	1.04	9	69	5.00		
Minimum	5-21	4.00	.50	4.00	.75	.75	2.00	2.17	.67	.75			1.00		
Maximum	6-12	4.00	.75	4.00	1.00	1.00	2.00	5.33	1.46	1.46			8.00		
Frequency (c)	95		6	6	5	5	90	88	88	88	9	69	71		
% Frequency (d)	100.00			6.32	4.81	6.32	94.74	92.63	92.63	92.63	9.47	72.63	74.74		
Average	9-0	4.00	.63	4.00	.88	.88	2.00	4.73	1.29	1.22	75	75	2.75		
Minimum	8-2	4.00	.36	4.00	.56	.56	2.00	3.08	.75	.75			1.00		
Maximum	9-16	4.00	.79	4.00	.98	.98	2.00	7.33	1.75	1.54			7.00		
Frequency (c)	93		18	13	17	17	86	93	89	91	75	75	73		
% Frequency (d)	100.00						92.47	100.00	95.70	97.85	80.65	75	78.49		
Average	12-0	4.00	.63	4.00	.88	.88	2.00	5.56	1.40	1.32	62	62	2.36		
Minimum	11-16	4.00	.36	4.00	.56	.56	2.00	3.83	1.00	.92			1.00		
Maximum	12-24	4.00	.79	4.00	.98	.98	2.00	8.42	2.13	1.75			6.00		
Frequency (c)	90		18	13	17	17	90	90	87	87	62	62	45		
% Frequency (d)	100.00						100.00	100.00	96.67	96.67	68.89	62	50.00		
Average	17-29	4.00	.63	4.00	.88	.88	2.00	7.09	1.45	1.35	56	56	2.32		
Minimum	16-29	4.00	.36	4.00	.56	.56	2.00	3.50	.63	.63			1.00		
Maximum	19-8	4.00	.79	4.00	.98	.98	2.00	11.00	2.00	1.96			7.00		
Frequency (c)	85		18	13	17	17	84	84	80	82	56	56	34		
% Frequency (d)	100.00						98.82	98.82	94.12	96.47	65.88	56	40.00		

- (a) Age is given in months and days.
 (b) Measurements of width and length are given in inches. The minimum and maximum values for measurements are averages for the three low animals and the three high animals respectively, excepting in cases where less than 6 animals are available.
 (c) Frequency refers to the number of animals for which data are given for any item.
 (d) Percentage frequency shows the relation of the number of animals represented for any item, to the total number of animals studied in that age group.
 (e) Size of depression is shown by grades ranging between 1 and 9.

STANDARD FOR MAMMARY DEVELOPMENT HOLSTEINS.

	Age (a)	Straight tubes		Quarters			Halves				General Development			
		Number of tubes	Number of enlargements	Number	Width		Number	Length (1)	Width		Number approaching	Number joined	Size of depression (e)	
					Front (b)	Rear (b)			Front (b)	Rear (b)				
Average	0-14		4.00											
Minimum			4.00	2.25										
Maximum		0-22	4.00	1.00										
Frequency (c)		71		4.00										
% Frequency (d)	100.00	100.00	71	4										
			5.63											
Average	1-1		3.96	3.17	3.00	.22	.27							
Minimum		0-16	1.00	1.00	2.00	.22	.22							
Maximum		1-17	4.00	4.00	4.00	.22	.31							
Frequency (c)		81		2	1		2							
% Frequency (d)	100.00	98.77	80	6	2.47	1.23	2.47							
			7.41											
Average	2-0		3.75	3.17	3.87	.33	.37							
Minimum		1-16	1.00	1.00	2.00	.13	.23							
Maximum		2-8	4.00	4.00	4.00	.60	.63							
Frequency (c)		79		23	39	36	37							
% Frequency (d)	100.00	62.03	29.11	49.37	45.57	46.84								
Average	3-0		2.69	2.13	3.81	.44	.52	1.94	1.79	.63	.72	13	9	7.00
Minimum		2-15	1.00	1.00	1.00	.15	.25	1.00	1.33	.42	.59			5.00
Maximum		3-13	4.00	4.00	4.00	.67	.75	2.00	2.25	.79	.96			8.00
Frequency (c)		93		8	73	63	67	16	15	15	15	13	9	12
% Frequency (d)	100.00	17.20	8.60	78.49	67.74	72.04	17.20	16.13	16.13	16.13	16.13	13.98	9.68	12.90
Average	4-0		3.20	2.25	3.86	.56	.66	1.98	2.33	.77	.83	16	42	6.94
Minimum		3-17	2.00	1.00	2.00	.23	.32	1.00	1.50	.46	.63			4.00
Maximum		4-12	4.00	4.00	4.00	.96	1.00	2.00	3.08	1.13	1.09			8.00
Frequency (c)		97		4	43	35	42	53	52	52	52	16	42	49
% Frequency (d)	100.00	5.15	4.12	44.33	36.08	43.30	54.64	53.61	53.61	53.61	53.61	16.49	43.30	50.52
Average	5-0		4.00	.63	4.00	.80	.80	2.00	2.78	.93	.94	16	59	6.31
Minimum		4-16	4.00	.36	4.00	.56	.56	2.00	1.83	.54	.63			2.00
Maximum		5-17	4.00	.79	4.00	.98	.98	2.00	4.50	1.33	1.33			8.00
Frequency (c)		94		18	13	17	17	76	76	76	76	16	59	62
% Frequency (d)	100.00			19.15	13.83	18.09	80.85	80.85	80.85	80.85	80.85	17.02	62.77	65.96
Average	6-0		4.00	.63	4.00	.88	.88	2.00	3.33	1.04	1.04	9	69	5.00
Minimum		5-21	4.00	.50	4.00	.75	.75	2.00	2.17	.67	.75			1.00
Maximum		6-12	4.00	.75	4.00	1.00	1.00	2.00	5.33	1.46	1.46			8.00
Frequency (c)		95		6	6	5	5	90	88	88	89	9	69	71
% Frequency (d)	100.00			6.32	4.21	6.32	94.74	92.63	92.63	92.63	92.63	9.47	72.63	74.74
Average	9-0		2.00					2.00	4.73	1.29	1.22	75	75	2.75
Minimum		8-2	2.00					2.00	3.08	.75	.75			1.00
Maximum		9-16	2.00					2.00	7.33	1.75	1.54			7.00
Frequency (c)		93						86	93	89	91	75	75	73
% Frequency (d)	100.00						92.47	100.00	95.70	97.85	97.85	80.65	75	78.49
Average	12-0		2.00					2.00	5.56	1.40	1.32	62	62	2.36
Minimum		11-16	2.00					2.00	3.83	1.00	.92			1.00
Maximum		12-24	2.00					2.00	8.42	2.13	1.75			6.00
Frequency (c)		90						90	90	87	87	62	62	45
% Frequency (d)	100.00						100.00	100.00	96.67	96.67	96.67	68.89	62	50.00
Average	17-29		2.00					2.00	7.09	1.45	1.35	56	56	2.32
Minimum		16-29	2.00					2.00	3.50	.63	.63			1.00
Maximum		19-8	2.00					2.00	11.00	2.00	1.96			7.00
Frequency (c)		85						84	84	80	82	56	56	34
% Frequency (d)	100.00						98.82	98.82	94.12	96.47	96.47	65.88	56	40.00

- (a) Age is given in months and days.
 (b) Measurements of width and length are given in inches. The minimum and maximum values for measurements are averages for the three low animals and the three high animals respectively, excepting in cases where less than 6 animals are available.
 (c) Frequency refers to the number of animals for which data are given for any item.
 (d) Percentage frequency shows the relation of the number of animals represented for any item, to the total number of animals studied in that age group.
 (e) Size of depression is shown by grades ranging between 1 and 9.

The Ten Items Having The Highest Correlation With
(1) Weight of Heart, (2) Weight of Lungs
and (3) Length of Intestines.

Weight of Heart.

1. Circumference of Heart (apex)	+ .5375 ± .0313
2. Body Weight	+ .5092 ± .0310
3. Surface Area of Body	+ .5029 ± .0312
4. Circumference of Fore Chest	+ .4938 ± .0316
5. Circumference of Rear Chest	+ .4835 ± .0321
6. Volume of Barrel	+ .4713 ± .0325
7. Depth of rear chest	+ .4569 ± .0331
8. Weight of Hide	+ .4472 ± .0335
9. Circumference of Paunch	+ .4372 ± .0338
10. Depth of Fore Chest	+ .4364 ± .0339

Weight of Lungs.

1. Volume of Barrel	+ .4429 ± .0354
2. Length, Withers to Hips	+ .4371 ± .0357
3. Depth of Fore Chest	+ .4323 ± .0359
4. Length, Withers to Pin Bones	+ .4228 ± .0362
5. Surface Area of Body	+ .4184 ± .0364
6. Depth of Rear Chest	+ .4178 ± .0364
7. Weight of Heart	+ .3944 ± .0375
8. Length of Thoracic Cavity	+ .3998 ± .0390
9. Depth of Paunch	+ .3792 ± .0378
10. Circumference of Fore Chest	+ .3718 ± .0380

Length of Intestines.

1. Weight of Intestines	+ .3872 ± .0345
2. Width of Thoracic Cavity	+ .3527 ± .0368
3. Weight of Heart	+ .3526 ± .0374
4. Depth of Rear Chest	+ .2865 ± .0359
5. Length of Thoracic Cavity	+ .3009 ± .0380
6. Weight of Lungs	+ .2999 ± .0404
7. Body Weight	+ .2682 ± .0363
8. Cross Section Area of Rear Chest	+ .2535 ± .0366
9. Depth of Fore Chest	+ .2523 ± .0366
10. Surface Area of Body	+ .2516 ± .0367

(Packing House Data)

Comparative Variability in Ante-Mortem
and Post-Mortem Data.

Ante-Mortem		Post-Mortem			
Item	Coef. of Variability	Item	Min.	Max. • Mean	Coef. of Variability.
Body Size					
Body Weight	11.85	Body Weight	660.00	1510.00 1060.00	11.85
Height Withers	3.74				
Withers to Pins	4.02				
Width Hips	5.45				
Width Loin	1.66				
Length Loin	9.39				
Average	6.02				
Circulation and Respiration					
Depth Fore Chest	4.03	Depth T.C.	43.00	59.00 49.59	4.50
Depth Rear Chest	4.50	Length T.C.	52.00	81.00 70.69	5.76
Width Fore Chest	7.96	Width T.C.	29.00	42.00 35.59	6.60
Width Rear Chest	6.79	Wt. Lungs	3.19	13.25 7.36	17.40
Cir. Fore Chest	4.33	Wt. Heart	2.81	5.94 4.42	13.27
Cir. Rear Chest	5.03	Cir. Heart	40.00	68.00 50.42	6.94
		Wt. Blood	24.00	76.00 40.69	18.02
Average	5.44	Average			10.35
Digestion and Assimilation					
Depth Paunch	5.35	Length Int.	95.00	193.50 139.46	9.64
Width Paunch	8.52	Weight Int.	15.50	31.00 21.36	12.15
Cir. Paunch	5.66	Wt. Liver	8.12	19.00 12.91	14.40
Average	6.51	Average			12.06
Endocrine Glands					
		Wt. Pancreas	1.00	17.62 7.46	42.53
Miscellaneous					
		Wt. Brain	8.12	20.00 15.60	9.77
		Wt. Spleen	1.00	3.06 1.77	17.49
		Average			13.63

(Packing House Data)

Variability in Ante-Mortem and Post-Mortem Data
Obtained with Jersey Cows at Beltsville, Md.

Ante-Mortem		Post-Mortem			
Item	Av. Variation Mean	Item	Min.	Max.	Mean
Body Size					
Body Weight	10.46	Body Weight	705.00	1227.00	935.00
Ht. Withers	2.52	Empty Body Weight	580.55	1055.65	801.39
Withers to Pins	3.03	Wt. Carcass	334.25	617.00	461.94
Width Hips	3.68				
Width Pin Bones	4.08				
Width Thurls	3.19				
Width Loin	6.54				
Length Loin	7.00				
Width Forehead	3.84				
Length Head	4.09				
Cir. Shin Bone	3.29				
Average	4.70	Average			11.67
Circulation and Respiration					
Depth Fore Chest	3.03	Depth T.C.	41.75	49.00	45.18
Depth Rear Chest	3.60	Length T.C.	65.00	78.50	71.08
Width Fore Chest	7.39	Width T.C.	29.10	37.50	33.04
Width Rear Chest	5.71	Area Trachea	3.90	10.40	8.24
Cir. Fore Chest	4.28	Wt. Lungs	4.85	12.95	7.03
Cir. Rear Chest	4.28	Wt. Heart (1)	2.88	4.30	3.55
		Wt. Heart (2)	2.60	3.95	3.24
		Cir. Heart (c)	43.00	55.00	47.35
		Cir. Heart (d)	47.50	59.70	52.27
		Wt. Blood	22.00	61.00	37.13
Average	4.72	Average			8.58
Digestion and Assimilation					
Depth Paunch	4.33	Length Int.	134.00	211.82	179.61
Width Paunch	7.68	Wt. Intestines	12.65	35.50	19.81
Cir. Paunch	4.96	Wt. Stomachs	18.95	47.00	31.42
		Wt. Liver	9.00	22.00	12.43
Average	5.66	Average			13.24
Endocrine Glands					
		Wt. Thyroid	21.50	57.00	34.40
		Wt. Pituitary	2.21	5.50	3.10
		Wt. Pancreas	141.80	551.00	358.40
		Wt. Adrenals	16.80	40.50	27.90
		Wt. Thymus	26.80	344.50	103.80
		Average			22.30
Miscellaneous					
		Wt. Brain	346.00	494.00	426.20
		Wt. Kidneys	657.70	1445.90	1007.70
		Wt. Spleen	417.00	1134.00	803.80
		Average			10.50

Variability in Ante-Mortem and Post-Mortem Data
Obtained with Holstein Cows at Beltsville, Md.

Ante-Mortem		Post-Mortem			
Item	Av. Variation Mean	Item	Min.	Max.	Mean
Body Size					
Body Weight	9.09	Body Weight	847.00	1610.00	1226.00
Ht. Withers	2.43	Empty Body Weight	720.65	1317.00	1032.77
Withers to Pins	2.44	Wt. Carcass	434.75	965.00	613.78
Width Hips	3.61				
Width Pin Bones	4.18				
Width Thurls	3.42				
Width Loin	3.37				
Length Loin	5.72				
Width Forehead	4.79				
Length Head	1.97				
Cir. Shin Bone	3.44				
Average	4.04	Average			11.33
Circulation and Respiration					
Depth Fore Chest	2.89	Depth T.C.	43.00	54.00	49.05
Depth Rear Chest	3.33	Length T.C.	72.00	87.00	80.40
Width Fore Chest	5.54	Width T.C.	32.60	41.60	37.83
Width Rear Chest	5.03	Area Trachea	10.40	18.60	12.96
Cir. Fore Chest	3.34	Wt. Lungs	7.20	14.15	9.26
Cir. Rear Chest	3.84	Wt. Heart (1)	3.50	5.81	4.74
		Wt. Heart (2)	3.20	5.05	4.21
		Cir. Heart (c)	48.40	61.00	51.85
		Cir. Heart (d)	53.50	63.35	57.36
		Wt. Blood	35.85	67.25	55.37
Average	4.00	Average			7.38
Digestion and Assimilation					
Depth Paunch	4.12	Length Int.	171.55	236.46	198.70
Width Paunch	6.43	Wt. Intestines	16.75	45.00	25.14
Cir. Paunch	4.47	Wt. Stomachs	26.95	50.35	39.94
		Wt. Liver	12.10	25.00	15.38
Average	5.01	Average			11.45
Endocrine Glands					
		Wt. Thyroid	19.40	59.20	38.40
		Wt. Pituitary	2.28	6.00	3.85
		Wt. Pancreas	315.50	648.00	475.20
		Wt. Adrenals	25.30	115.00	40.60
		Wt. Thymus	36.90	417.50	141.60
		Average			23.69
Miscellaneous					
		Wt. Brain	375.70	497.80	428.00
		Wt. Kidneys	944.50	2523.20	1461.00
		Wt. Spleen	635.00	1202.00	950.70
		Average			12.27

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* Records made in neighbor's hand, calves bought by Tasskitch.

Owner	Sex	Daughter	Age	Age	Number	Age	Annual Production	Cal. Production	Type
Number	Number	Number	Actual	Actual	in	Cal. 1st	2015	2015	
			Y	Y	1st	Cal. 1st	Female	Female	
1	1	1	1	1	1	1	1,761	1,761	1st
2									
3	1	1	1	1	1	1	1,761	1,761	1st
4									
5	1	1	1	1	1	1	1,761	1,761	1st
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t. average of all daughters
tested.

	2			12			5								
a. No. of tested pairs	% B'fat	lbs. Milk	lbs. B'fat	% B'fat	lbs. Milk	lbs. B'fat	% B'fat	lbs. Milk	lbs. B'fat	% B'fat	lbs. Milk	lbs. B'fat	% B'fat	lbs. Milk	lbs. B'fat
b. Average of daughters	4.10	9007	367	4.30	8708	386	4.36	6042	364						
c. Average of their dams	3.68	9475	368	3.66	8309	388	3.58	7496	389						
d. Increase (b - c) or decrease (c - b)	+0.22	-464	-1	+0.36	-460	-62	+0.44	-1454	-25						
e. $\frac{d}{c} \times 100$ (percentage)	+5.7	-4.9	-3	+6.6	-38.2	-15.0	+11.8	-19.4	-6.7						
f. No. daughters equal to or better than dams	5	2	3	9	0	1	4	2	2						
g. $\frac{f}{c} \times 100$ (percentage)	100.0	40.0	60.0	75.0	0	8.3	80.0	40.0	40.0						
h. Cumulative herd average	3.80	8900	339	3.50	8535	349	4.08	7510	303						
i. $\frac{h}{c} \times 100$ (percentage)	102.1	106.5	108.6	101.5	93.2	94.0	96.1	99.8	95.4						
j. Score of bull B e	+09	-05	= 2	+43	-136	-135	+56	-77	-44						
k. Score of bull B f g	+50	-10	+10	+03	-30	-18	+30	-18	-18						
l. Score of bull B i	+4	+13	+17	+3	-14	-12	= 8	0	-9						
m. Total of j, k, and l	+83	-22	+85	+71	-220	-179	+77	-107	-63						
n. Classification of bull	B	F	F	B	F	F	B	F	F						
o. Notes on feeding and management	2 milkings			2 milkings			2 milkings								
p. Total daughters sired that calved in this herd	6			12			5								
q. Total daughters tested	5			12			5								
r. $\frac{p}{q} \times 100$ (percentage)	83.3			100.0			100.0								
s. Qualifying statements															

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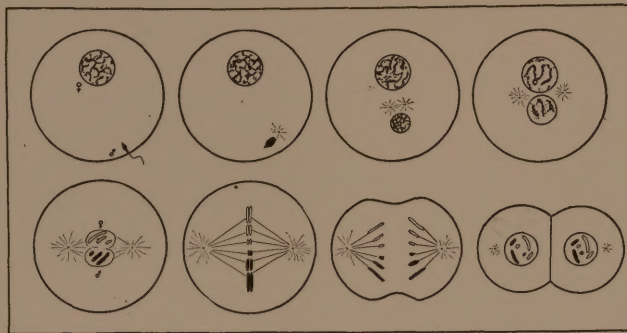
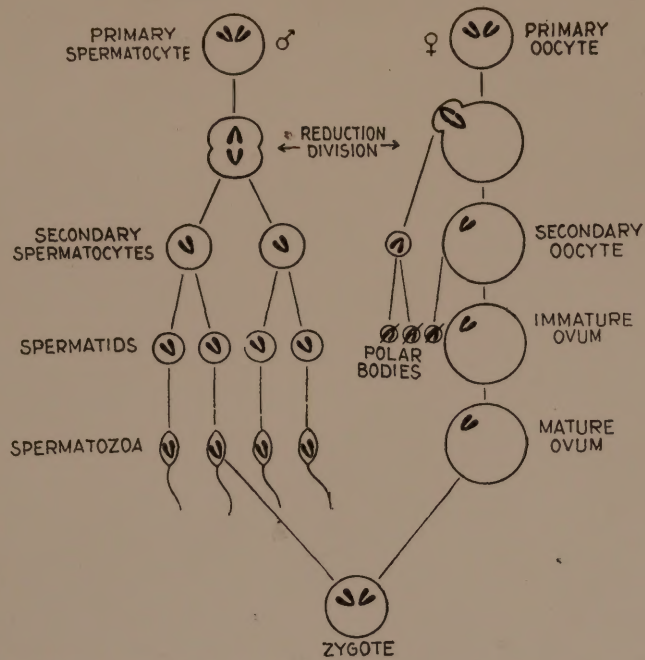


FIG. XI. Diagram of fertilization and cleavage in an animal. It is assumed that maturation has already occurred and the female pronucleus (♀), as well as the male pronucleus (♂), is already in the haploid state. Upper row, fertilization; lower row, chromosome relations in the first cell-division of the fertilized egg. Chromosomes derived from the sperm shown in black, those of the egg in outline only. After Sharp, Cytology. Copyright, McGraw-Hill Book Co. By permission.

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Comparative diagram of spermatogenesis and oögenesis. (From Mohr.)

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Right Lung- Sophie 19th of Hood Farm - 6-19-24



Left Lung- Sophie 19th of Hood Farm - 6-19-24



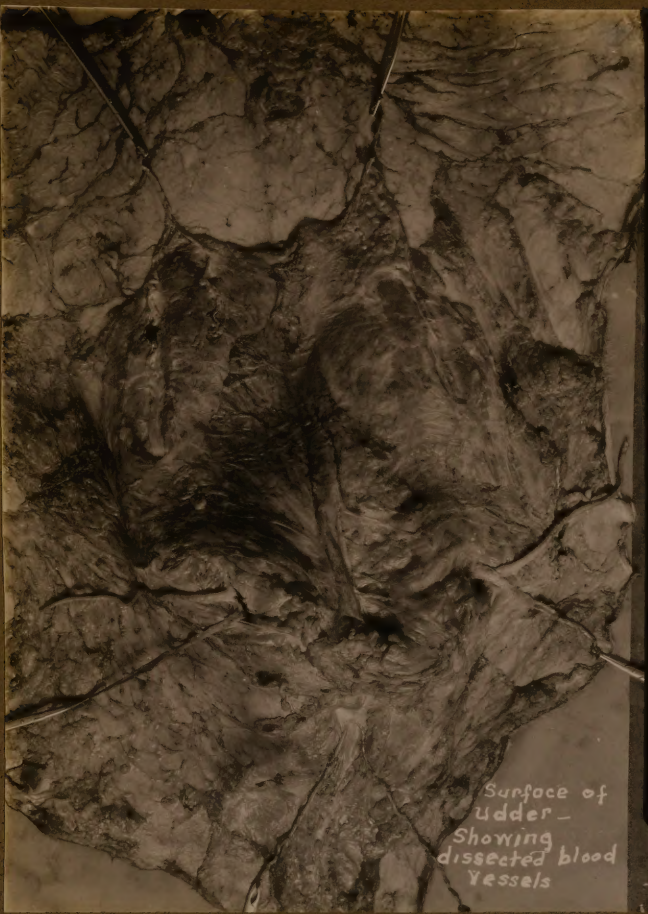
Uterus - Sophie 19th of Hood Farm
6-19-24



Ovaries
Sophie 19th of
Hood Farm
6-19-24

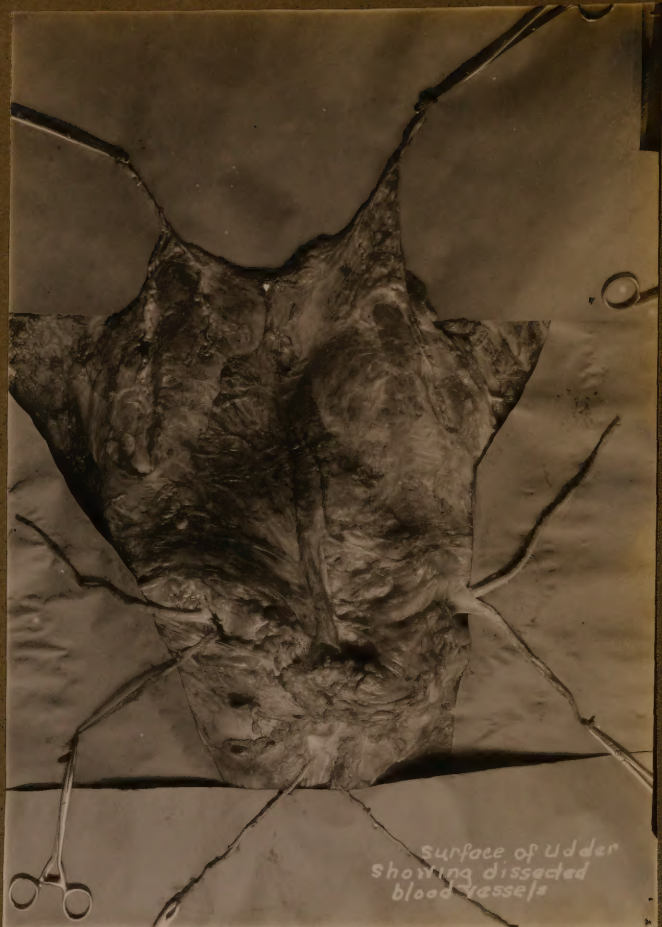
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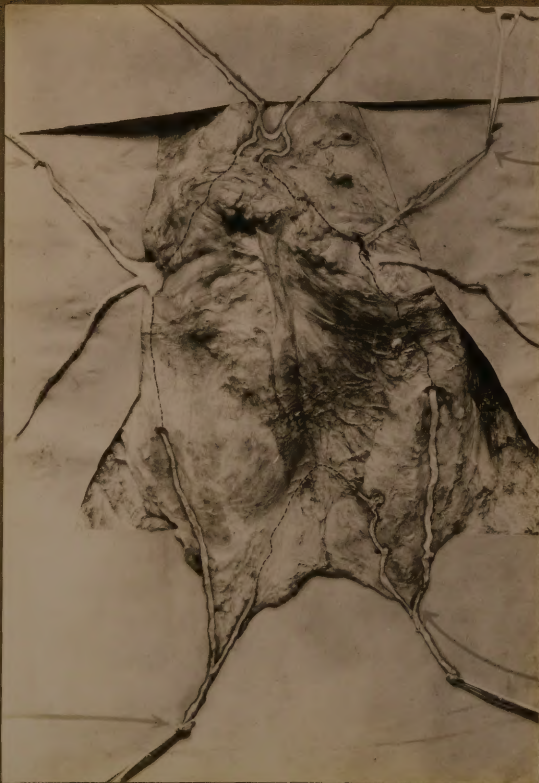
Surface of
Udder -
Showing
dissected blood
Vessels

10405

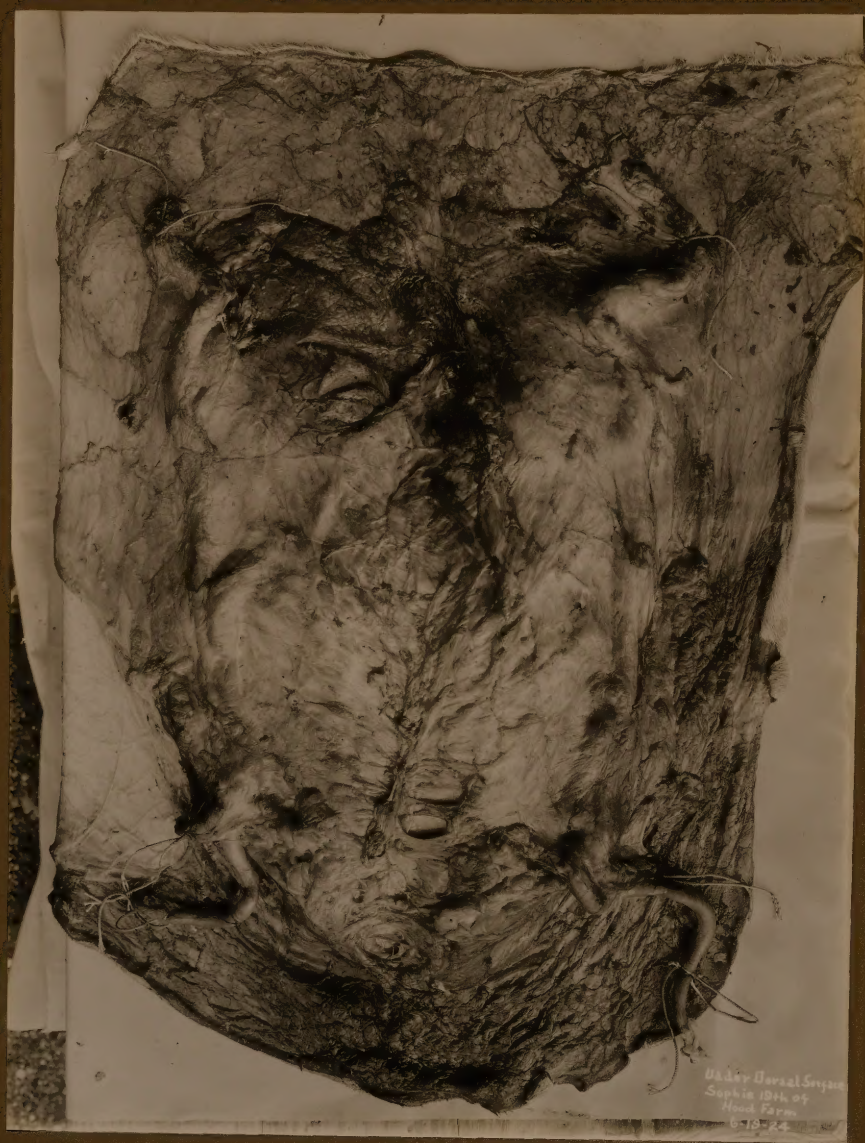


Surface of Udder
showing dissected
blood vessels

10404



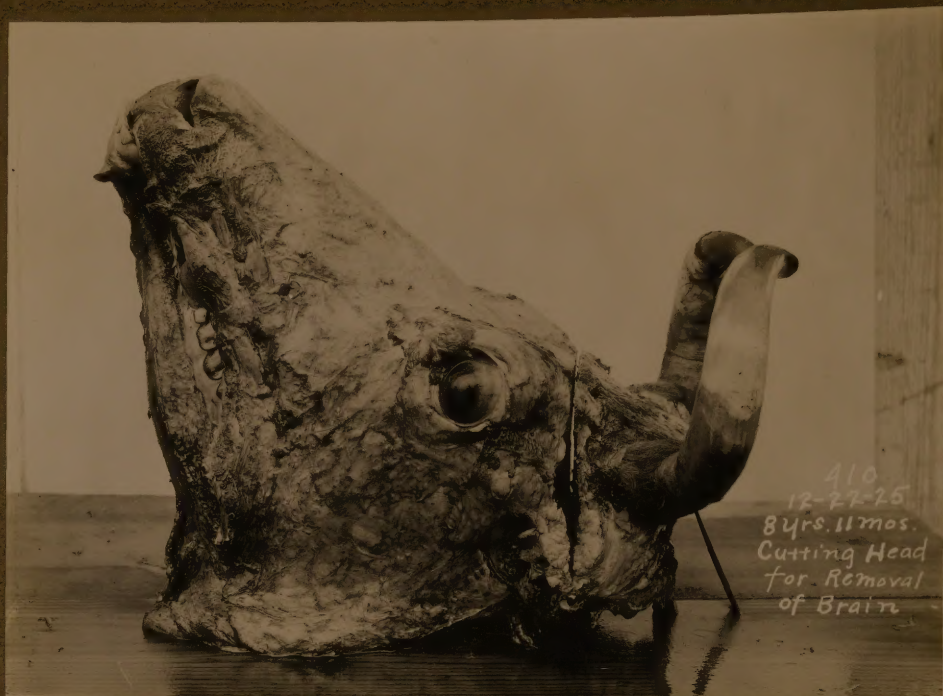
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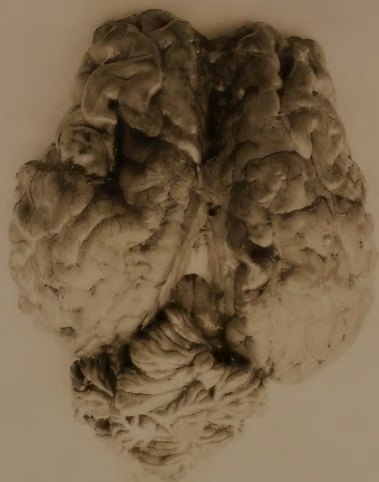


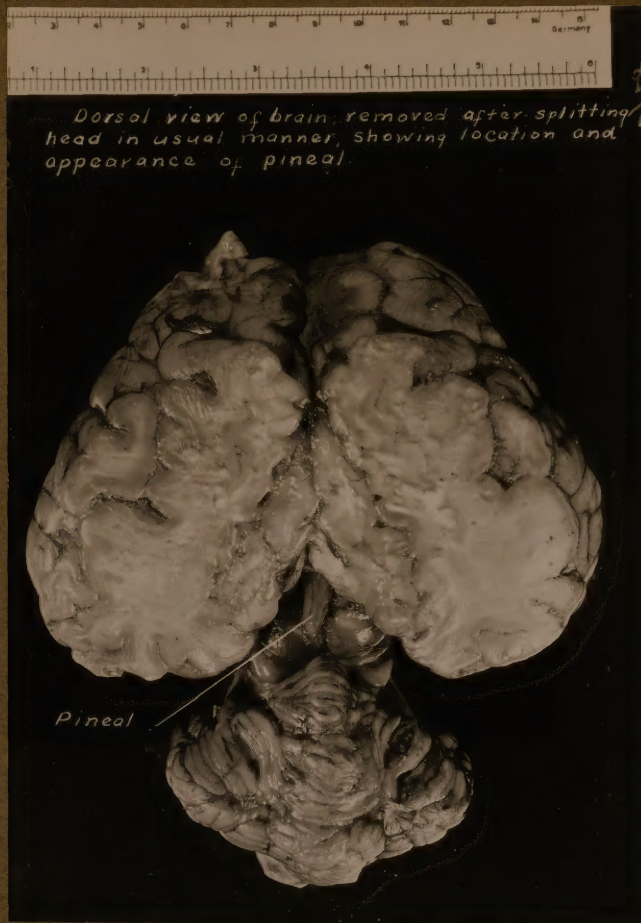
Walley Osgood's
Sketch 18th of
Wood Form
6-18-24



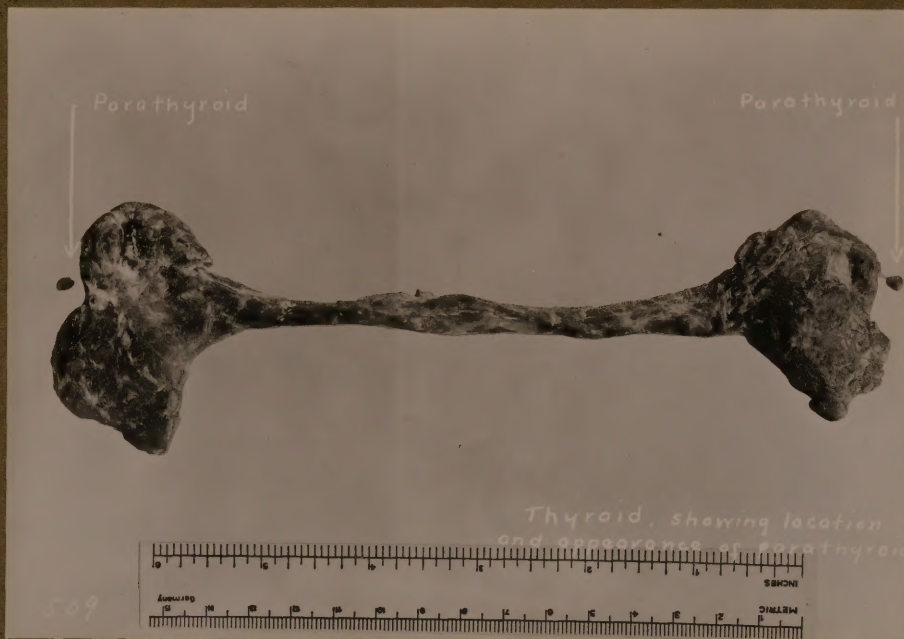
410
1-5-26
8 yrs.-11 mos.
M-89
Dorsal view of Todd
dissection to show blood vessels







20918



20917



Thyroid
Attached to Trachea
dog - pointer to lungs
dog - 10.10.10



Thyroid
Removed from Trachea
dog - 10.10.10



Side View of Trachea

15343



Measuring Inside Diameter of Trachea

15345



Measuring Outside Diameter of Trachea

15347



15346



15341

Dissecting cartilage of Trachea

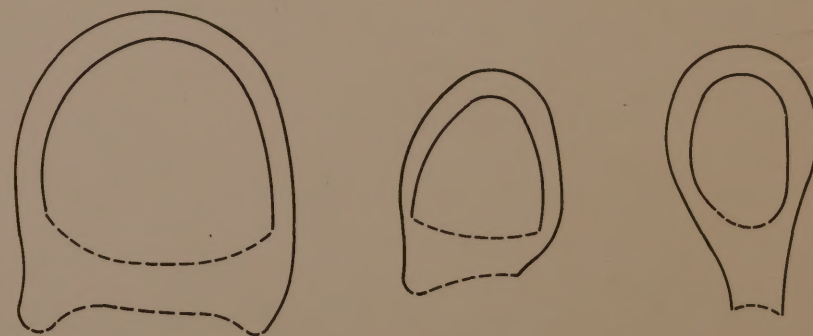


15342

Dissecting cartilage of Trachea



15344



*DRAWINGS OF CROSS SECTION OF TRACHEA.
SECTIONS FROM THREE DIFFERENT ANIMALS
TO SHOW VARIATIONS IN SIZE AND SHAPE.*

15378



Heart No.1
Surface Fat Removed.
Showing Line to Be Followed in Removing Arteries.



Do Not Weigh or Measure in This Condition.

Heart No.2
Surface Fat Removed.
Showing Line to Be Followed in Removing Veins



Do Not Weigh or Measure in This Condition.

Heart No. 3
Surface Fat Removed.
Arteries and Veins Removed.
See Illustration No. 4



Secure Weight and Measurements In This Condition.
Enter Post Mortem Outline *34a, & *35a, b, c, d.

Heart No. 4
Surface Fat Removed.
This is Reverse Side of Heart
Shown in Illustration No. 3.



Secure Weight and Measurements in This Condition
Enter Post Mortem Outline *34a, & *35a, b, c, d.

Heart No. 5
Surface Fat Removed.
Arteries and Veins Removed.
Auricles and Auricular Bridge
Removed at Base of Heart.



Secure Weight in This Condition.
Enter Post Mortem Outline * 36.



223 Heart
Trimmed of fat
and vessels.
Ears attached.
12-11-24



223
Heart
Trimmed of ears,
fat and vessels.
12-11-24



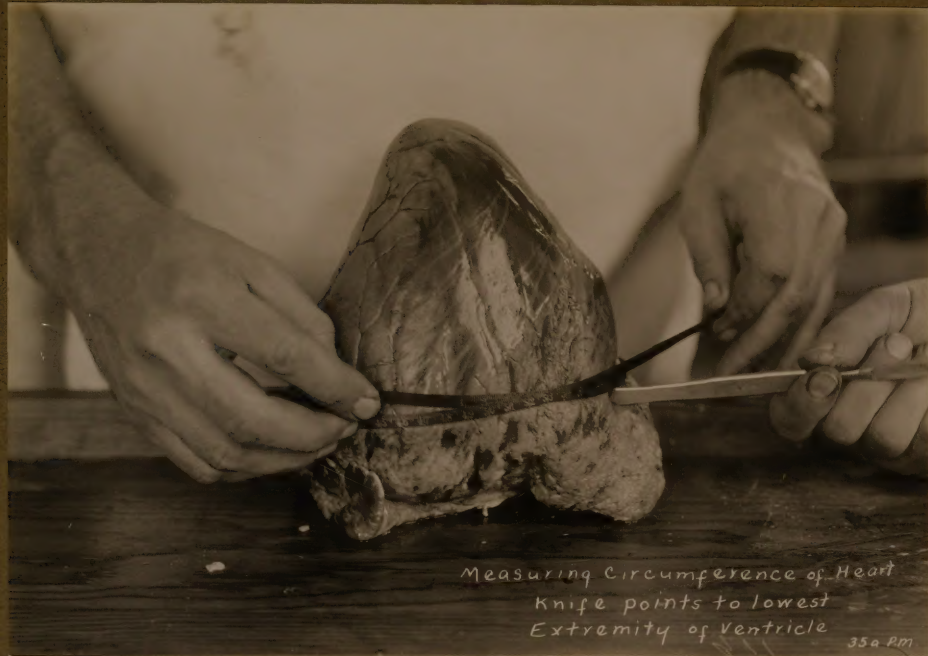
473
Heart as removed.
Ears, fat and vessels
attached.
12-11-24.



473 Heart.
Trimmed of fat
and vessels.
Ears attached.
12-11-24



473
Heart
Trimmed of ears, fat,
and vessels.
12-11-24.



23043



23042



23041



23040



First Step in Removing Veins
from Heart 34 PM

23039



Intermediate step in
Removing Veins from Heart 34 PM

23038



Final Step in Removing Veins from Heart 34 PM

23037



23033



23030



23035



23029



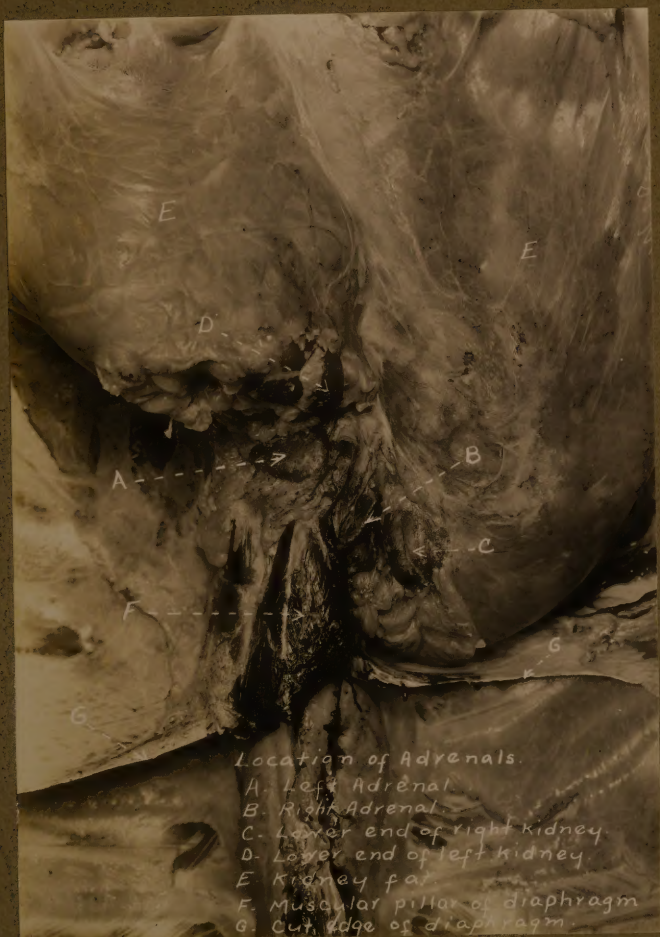
23032



23034



23028



23027



23031



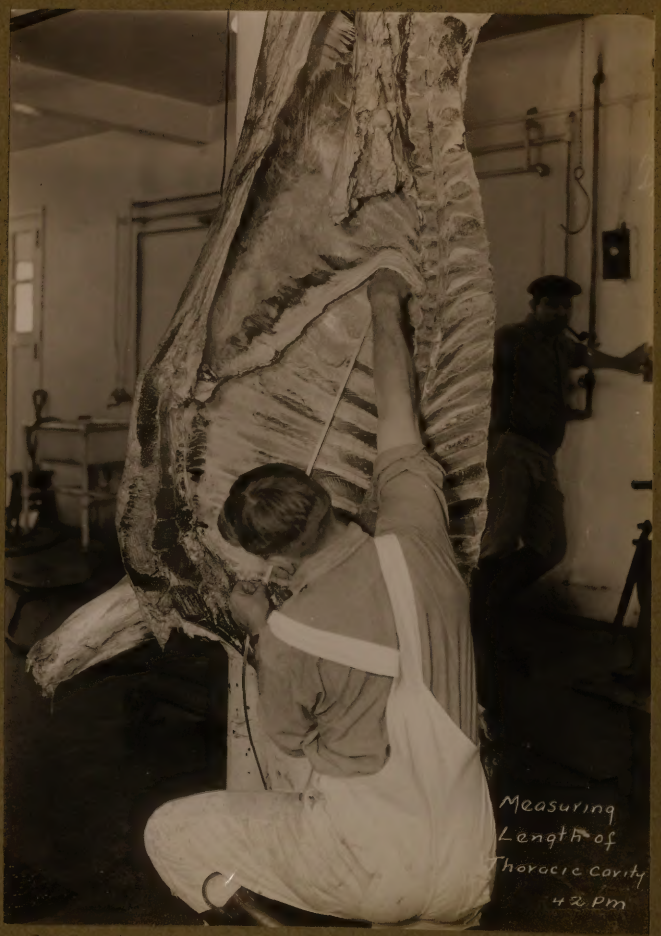
23045



23044

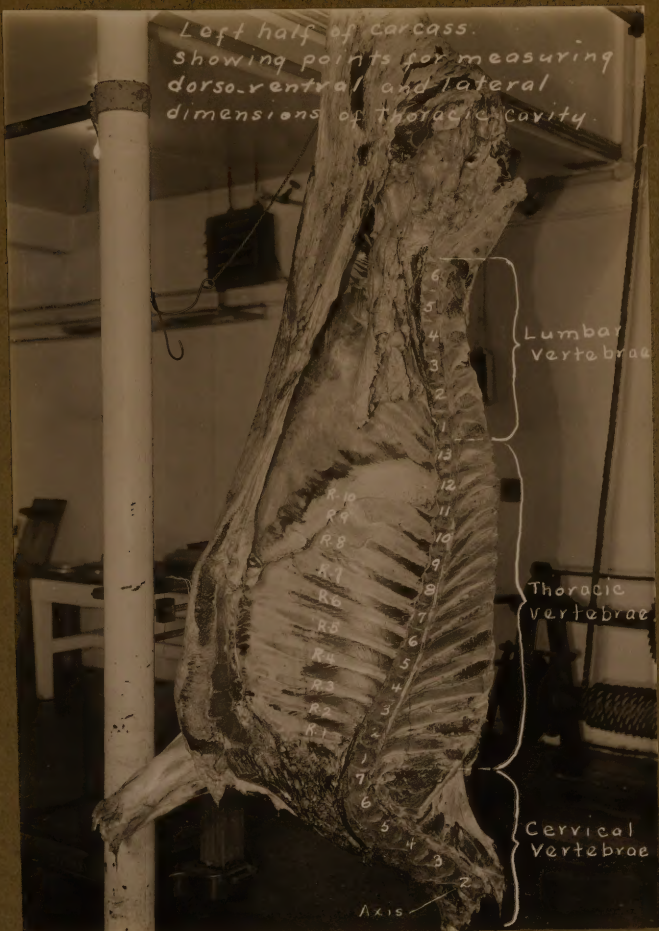


23036



23046

Left half of carcass.
showing points for measuring
dorso-ventral and lateral
dimensions of Thoracic cavity.

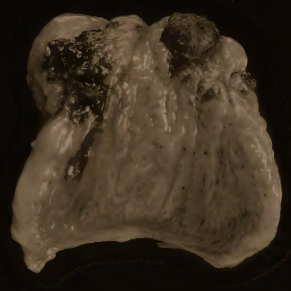
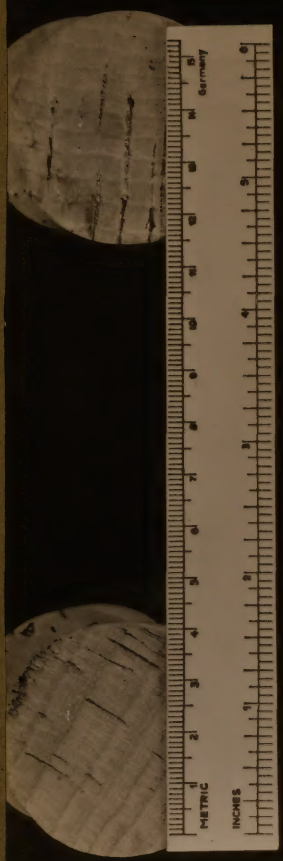


23047



Larynx
627

X 3625



Larynx
627

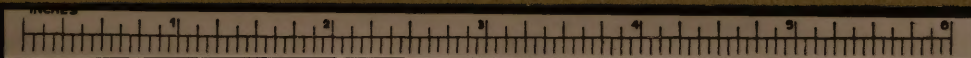
X 3624



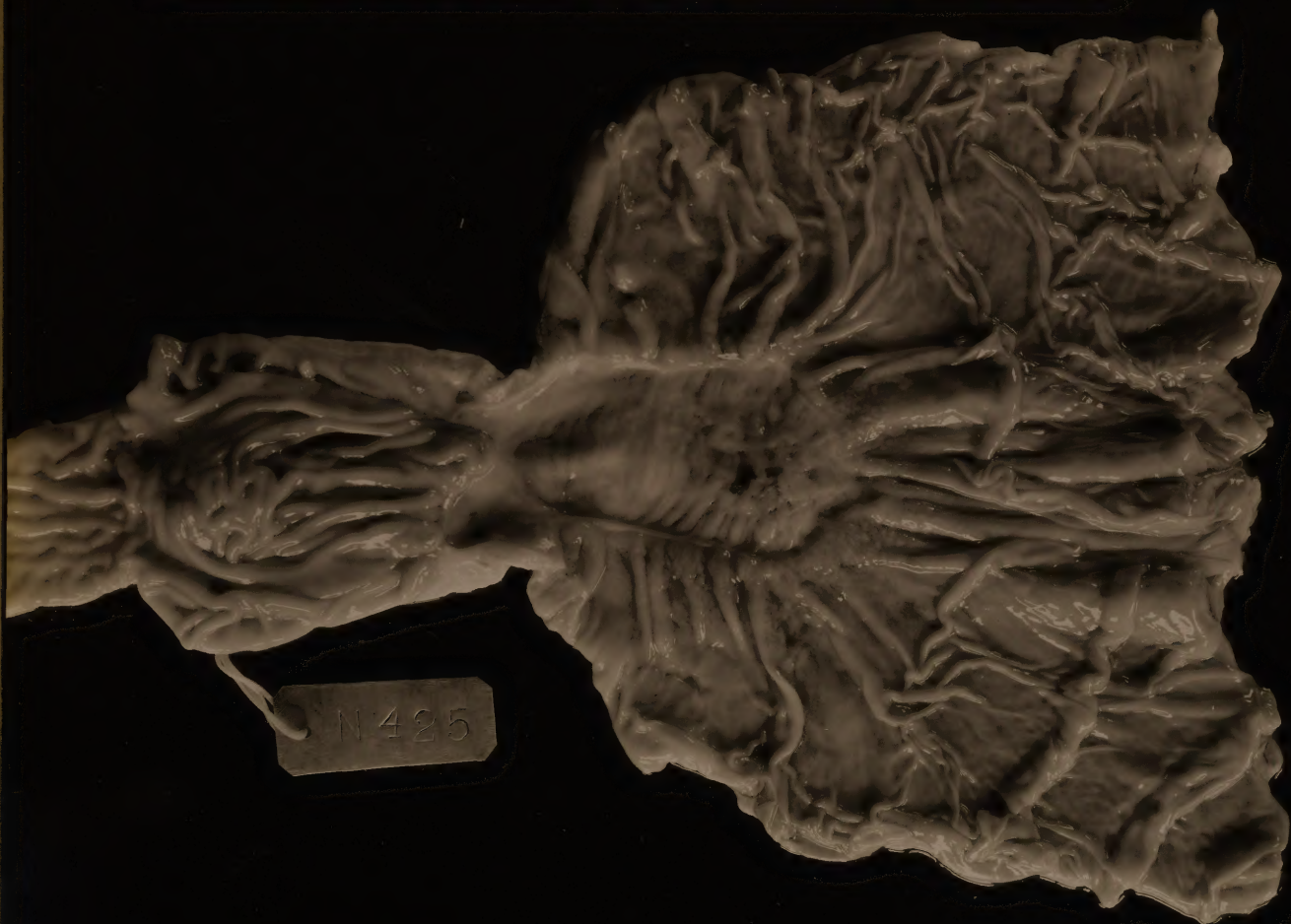


Stomach ulcer

X 3632

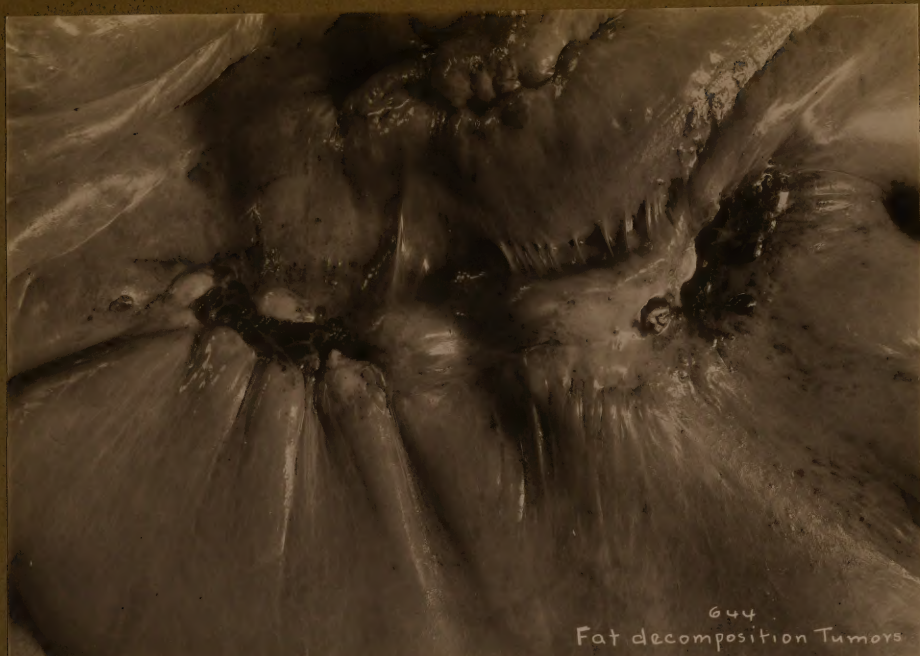


X 3631



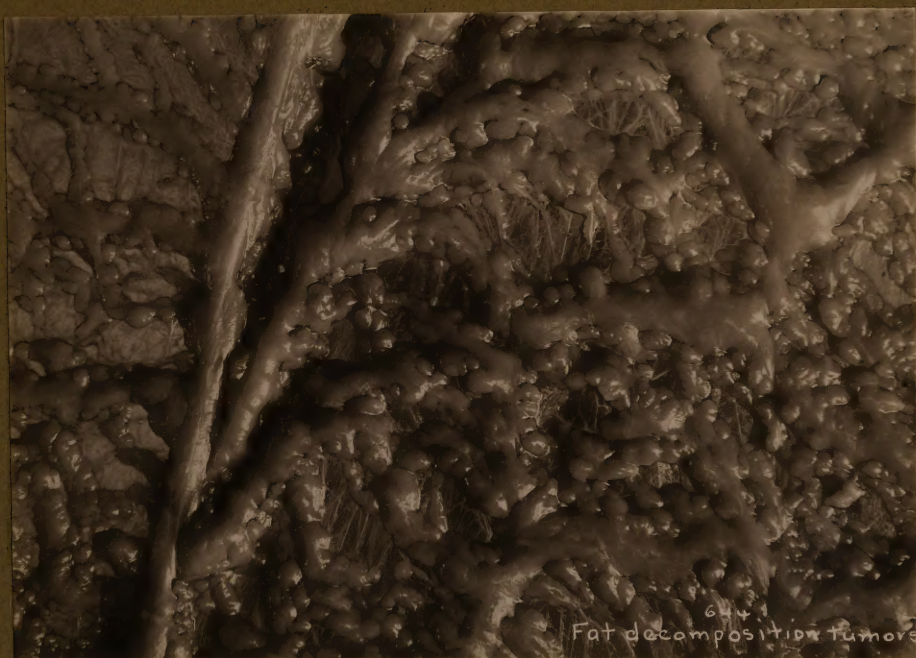
Stomach ulcer

X 3631



644
Fat decomposition Tumors

21948



644
Fat decomposition Tumors

21949



644
Fat decomposition Tumors

21950



20786



20787

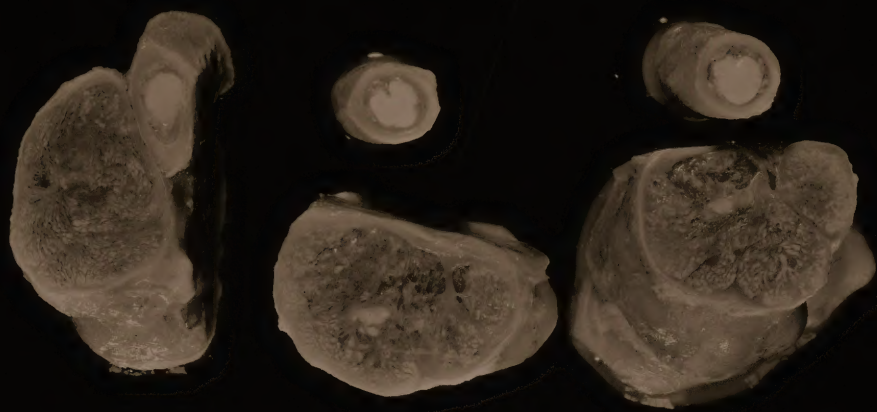
X3271



X3271



X3272



x3270





20853



20854



20852



20855

994



20856

994

3268



994

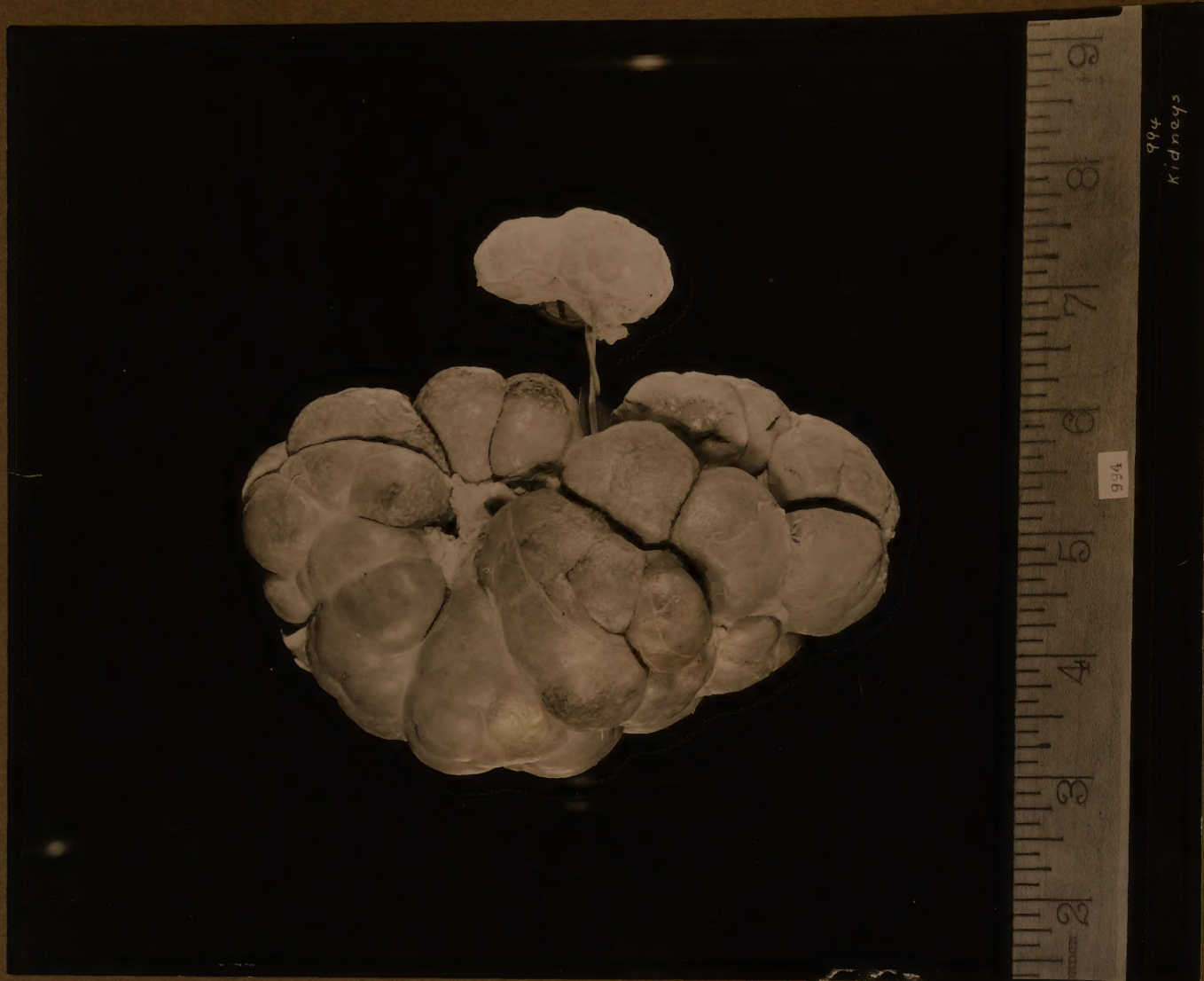
External Genitalia

3267



994

Internal Genitalia



X3269



X3526





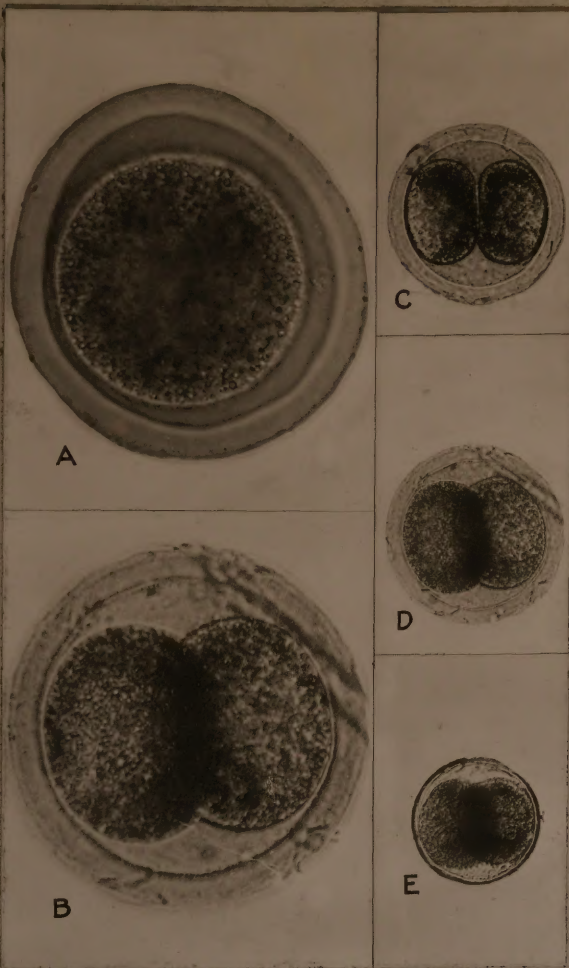


X3527

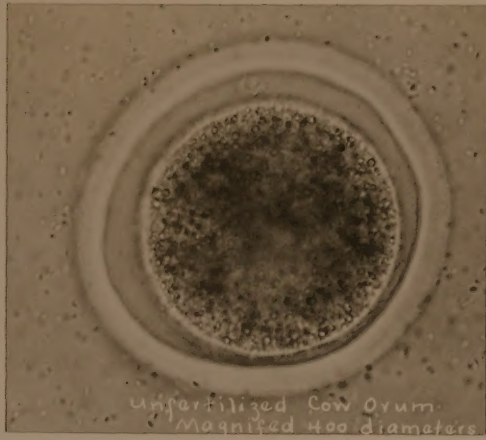


X3529

< Same size > 11

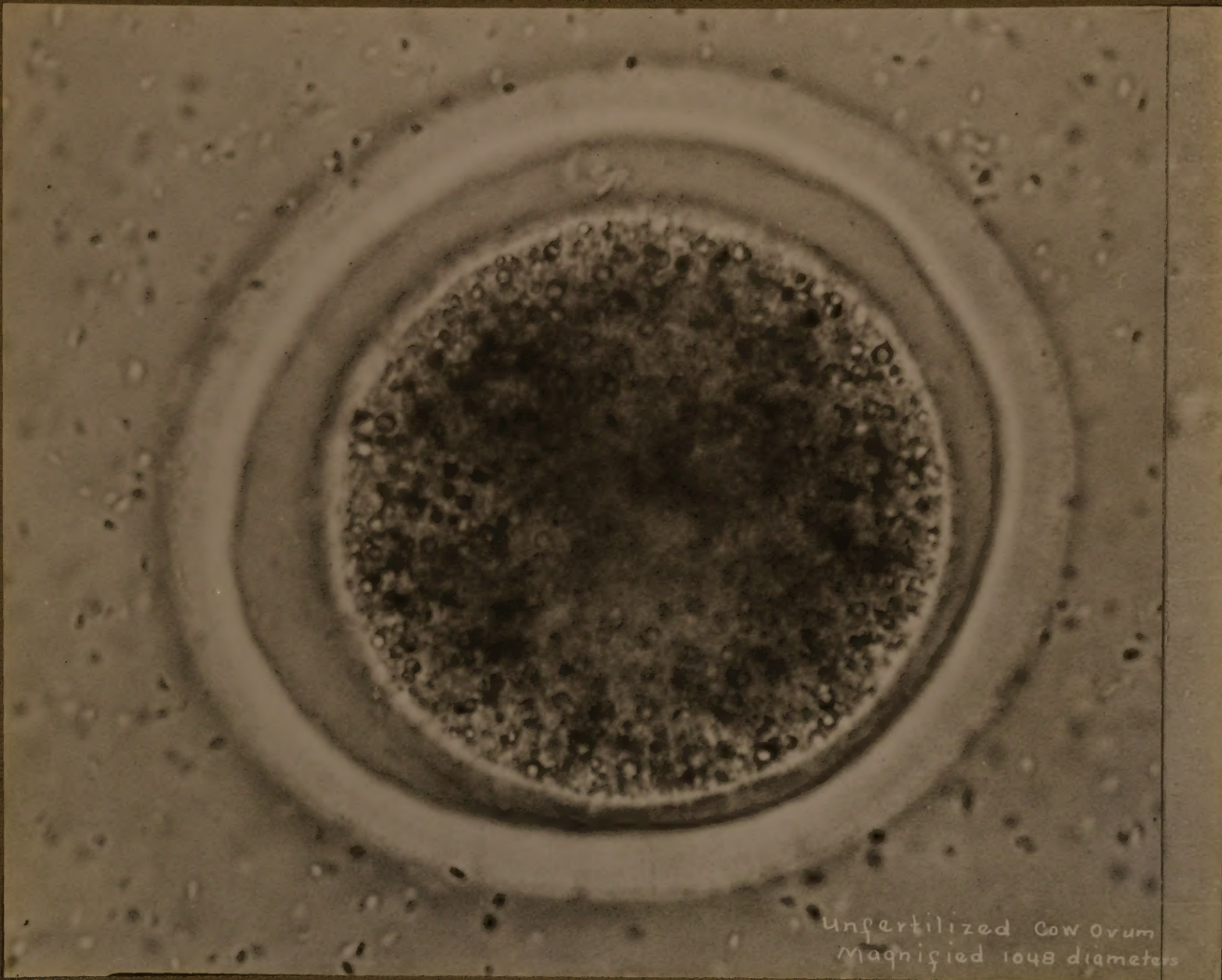


m 2146



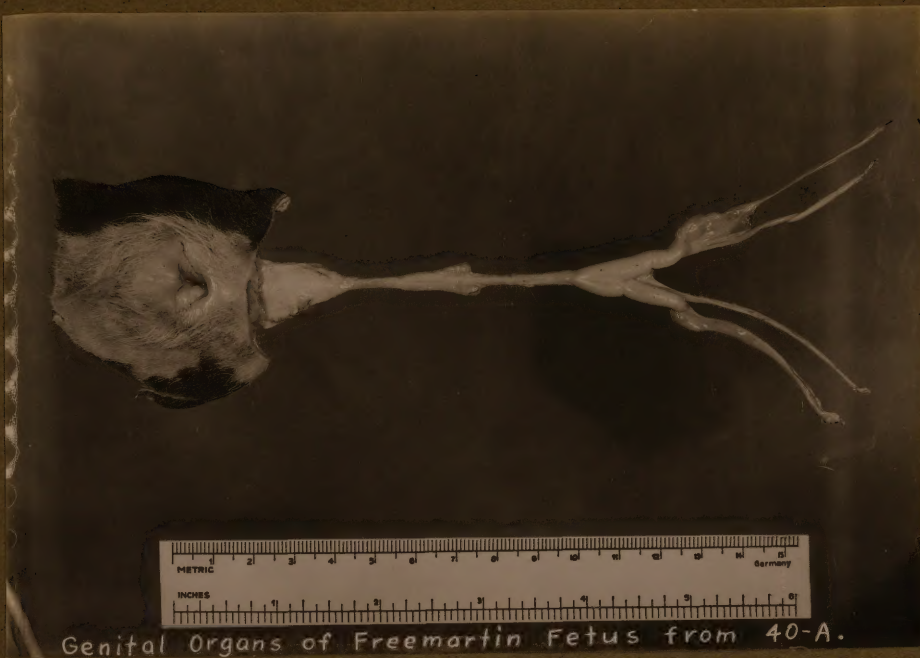
unfertilized Cow Ovum
Magnified 400 diameters

16637

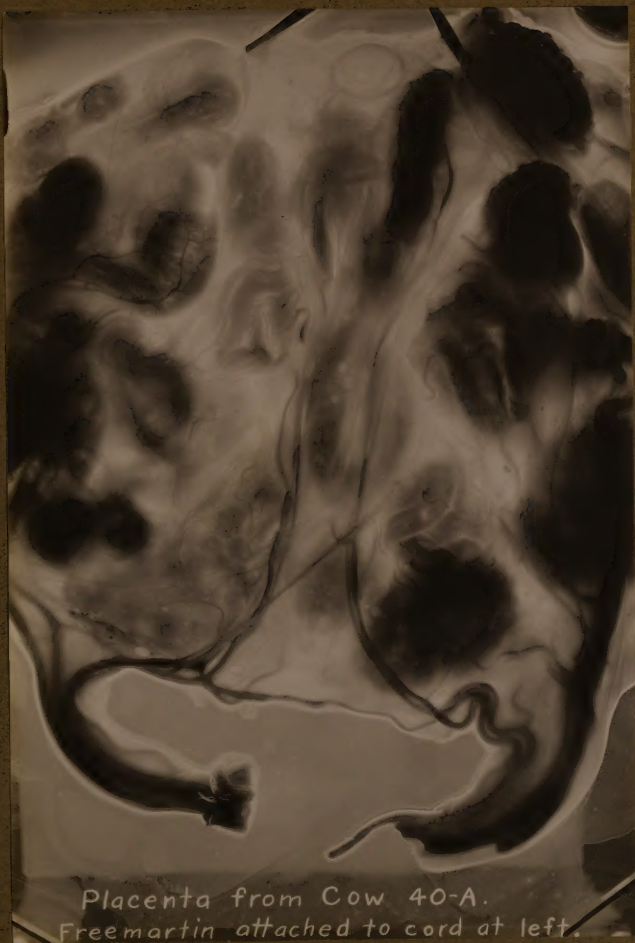


unfertilized Cow Ovum
Magnified 1048 diameters

X2394



17470



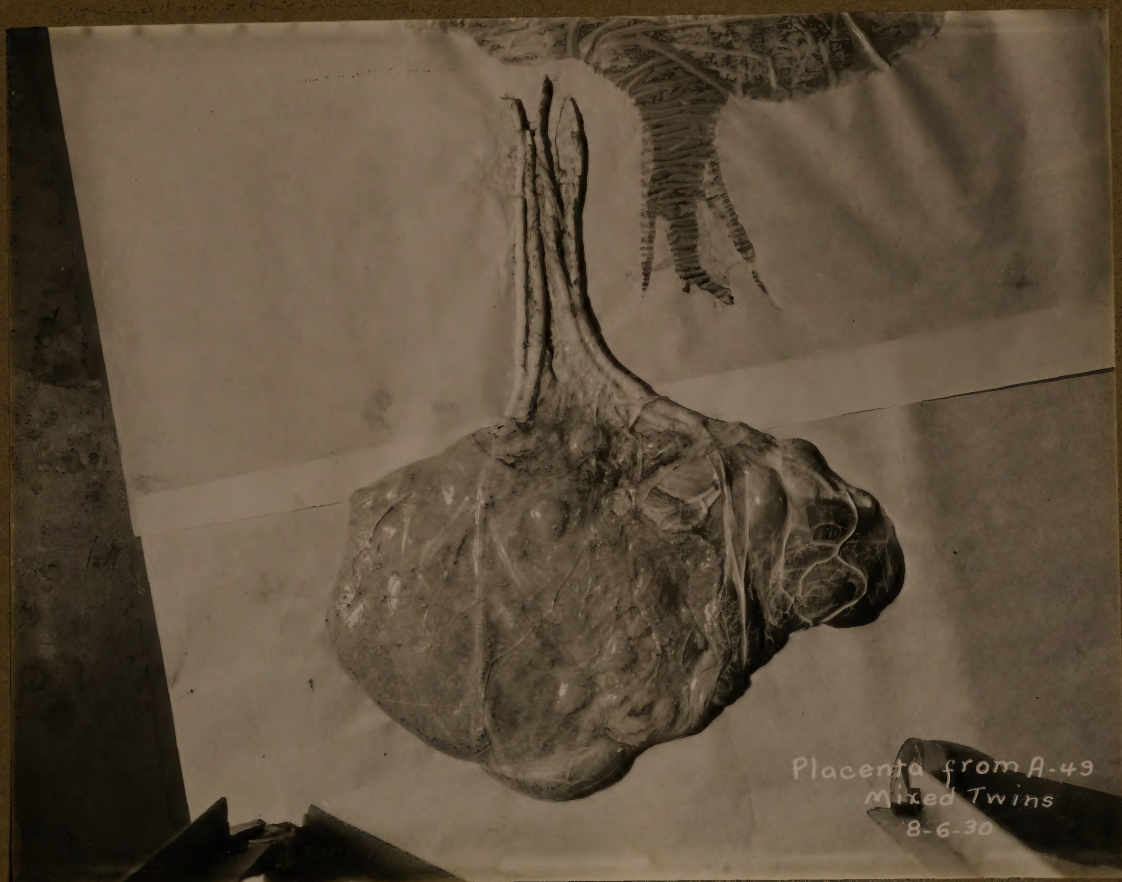
17471



17472



M. 2083



M. 2082



Placentae from A-49
Mixed Twins
8-6-30

M-2084



143-day ♀ Fetus
.34 N. Cow #499

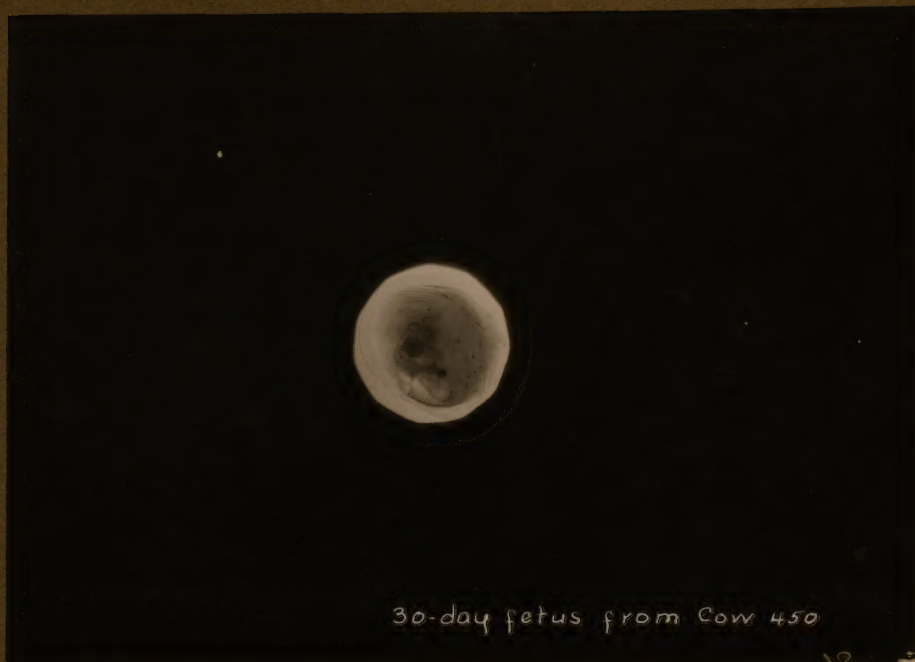
M-2098



M-2097

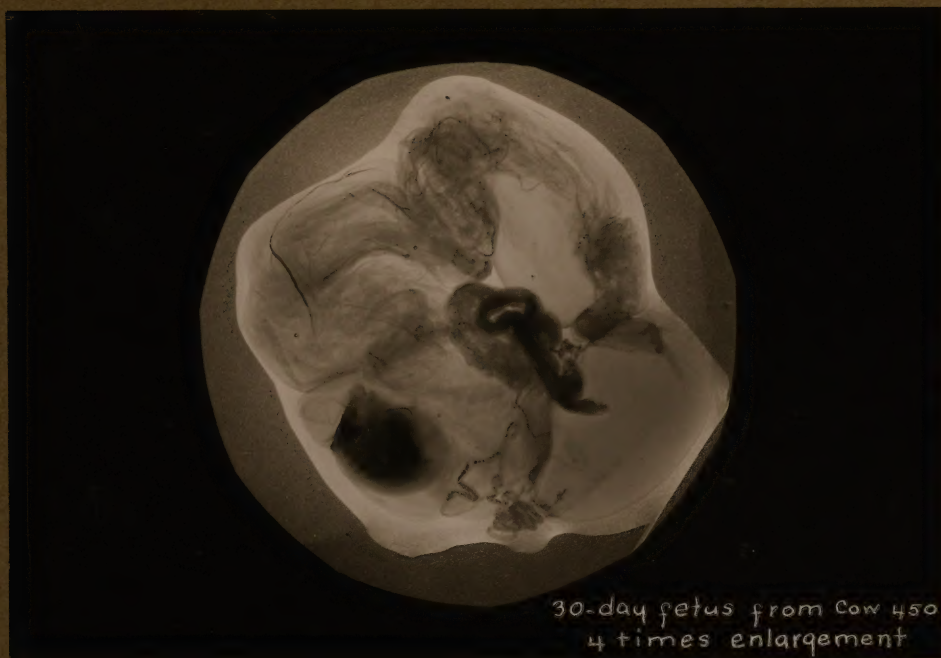


M-2096



30-day fetus from Cow 450

15391



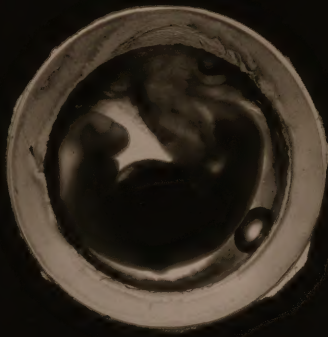
30-day fetus from Cow 450
4 times enlargement

15390



33-day Twin Fetus from Cow #N 207
4.00 N.
(a)

17908



33-day Twin Fetus from Cow #N 207
4.00 N.
(b)

17907



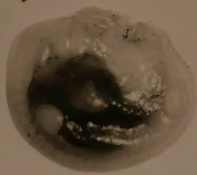
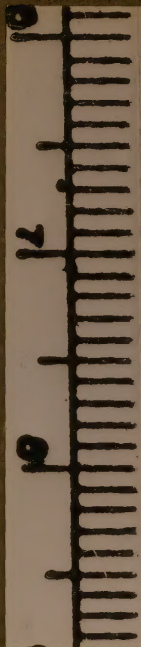
50-day Fetus from Cow 394
200 H. 1939

19399



50-day Fetus from Cow 394
200 H. 1939

19400



G 10
30-day
2-4-57

30-day Fetus from Cow
Enlarged in 1957

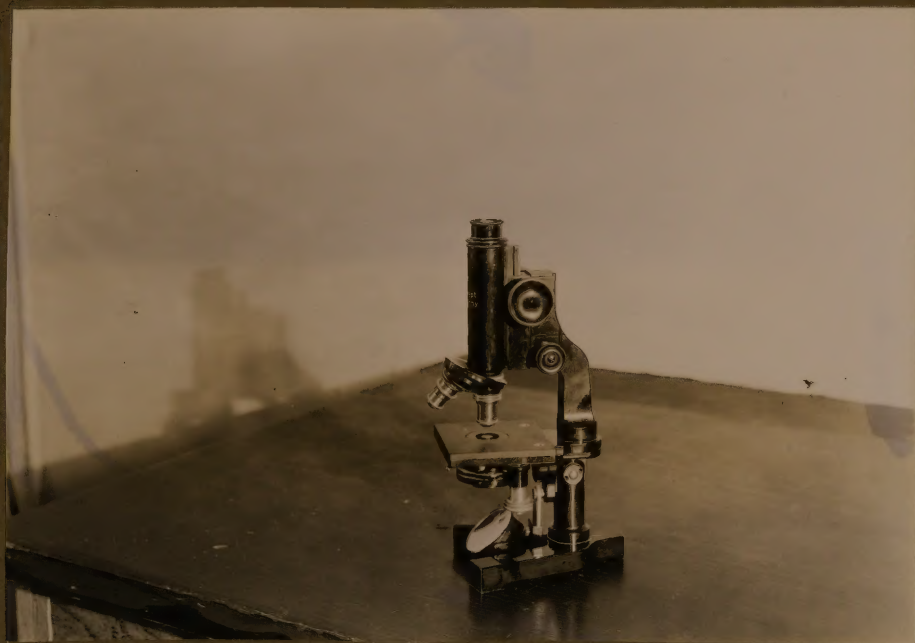
19180



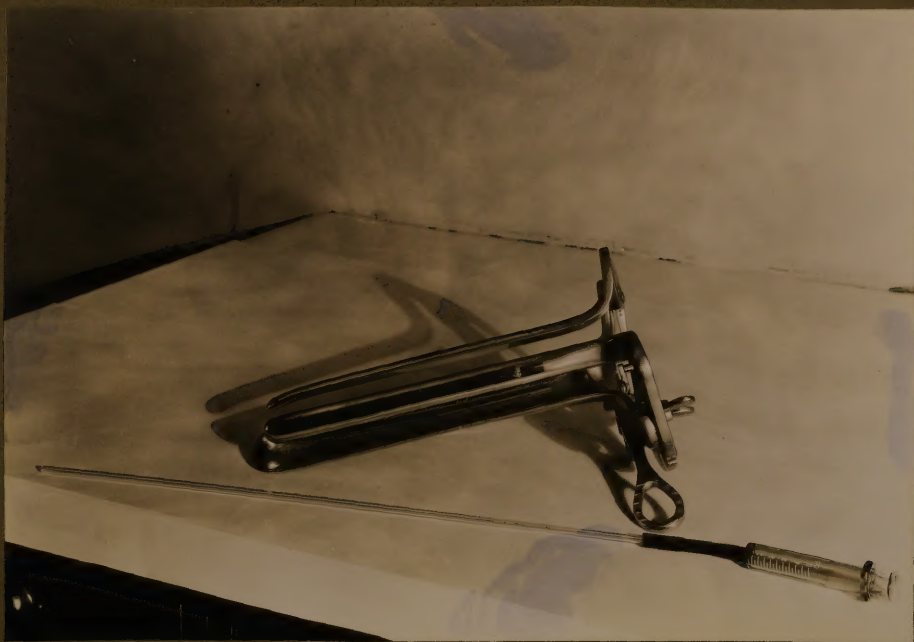
Fetus from #230
at 226 days
Wt. - 28 $\frac{3}{4}$ lbs.
10-21-26



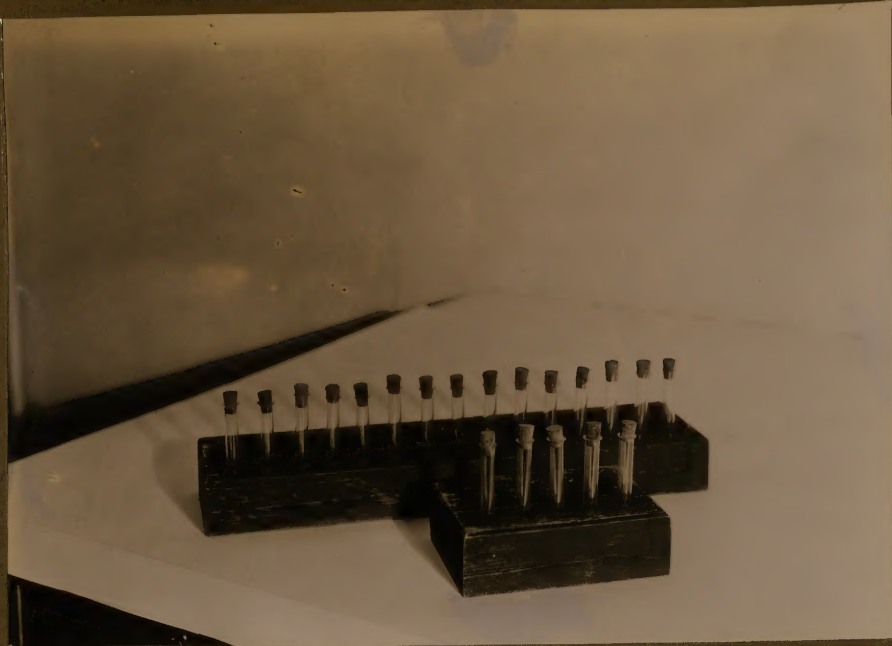
26298



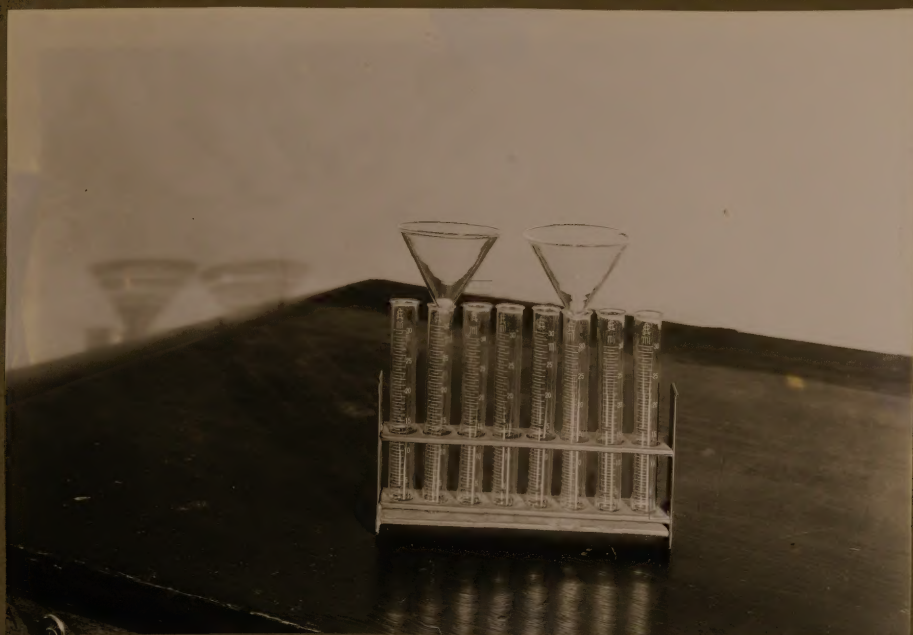
26299



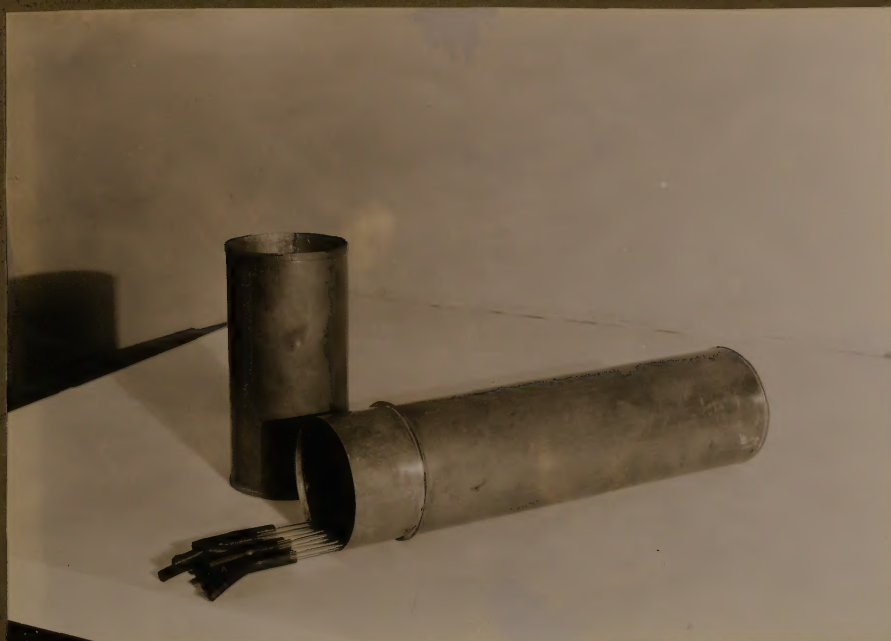
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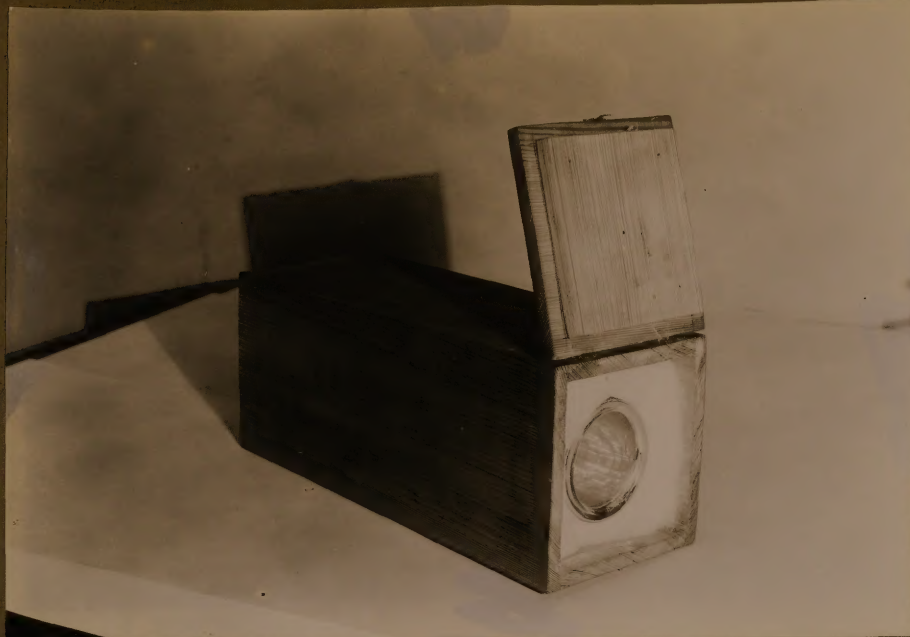
26294



26300



26295



26296



26301



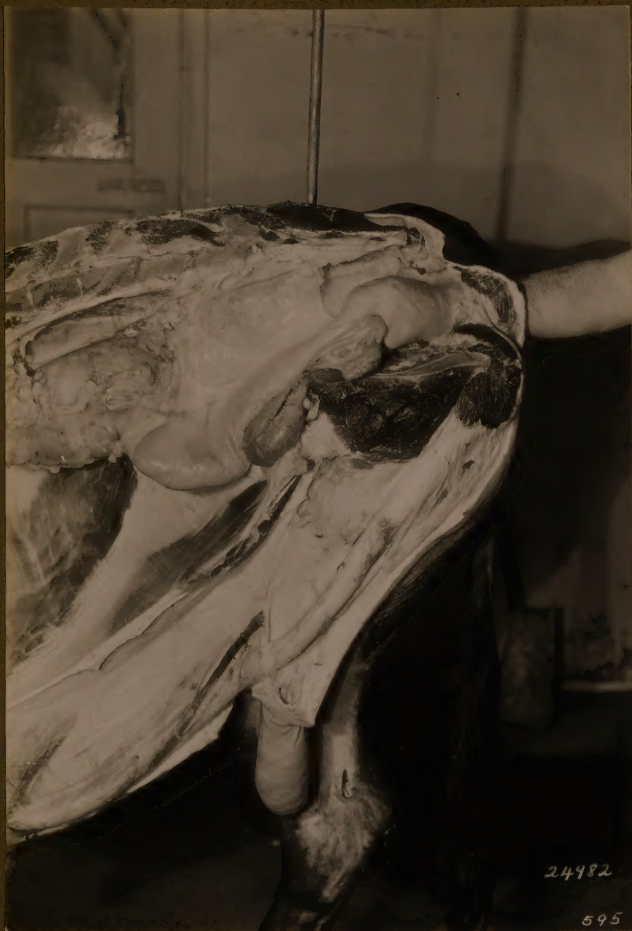
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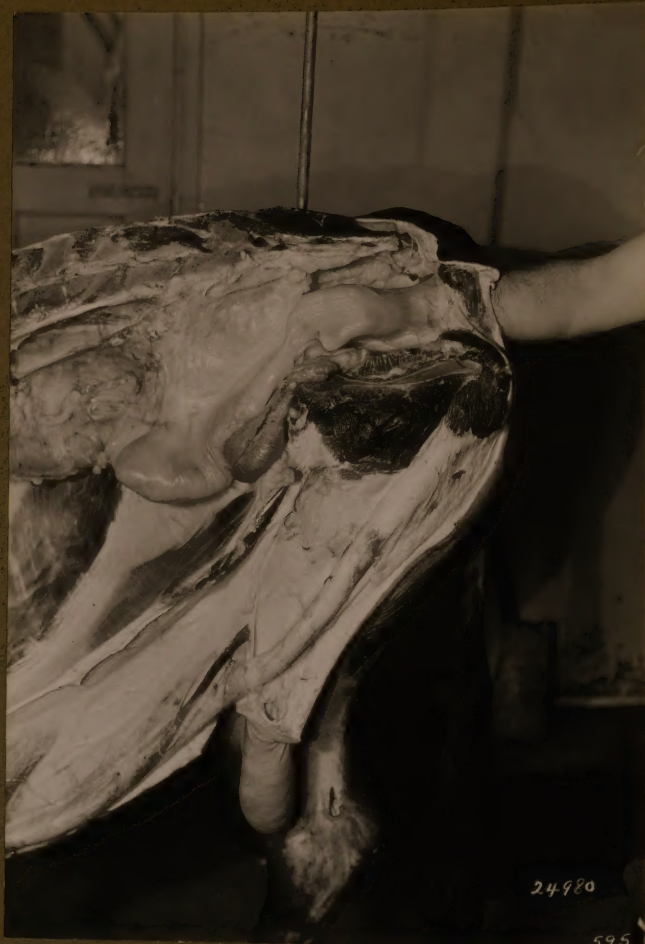
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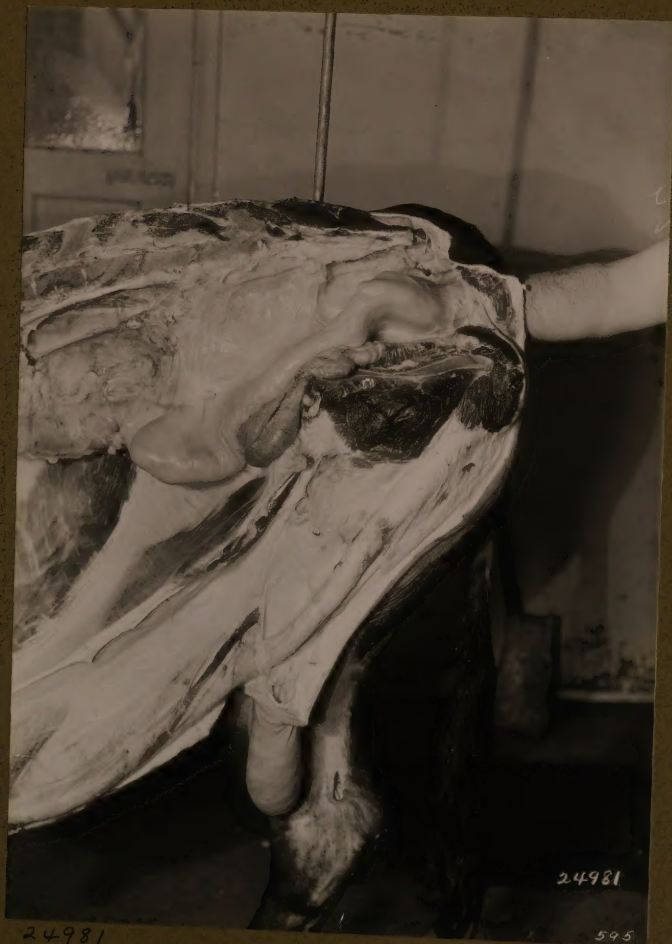
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24982



24980



24981

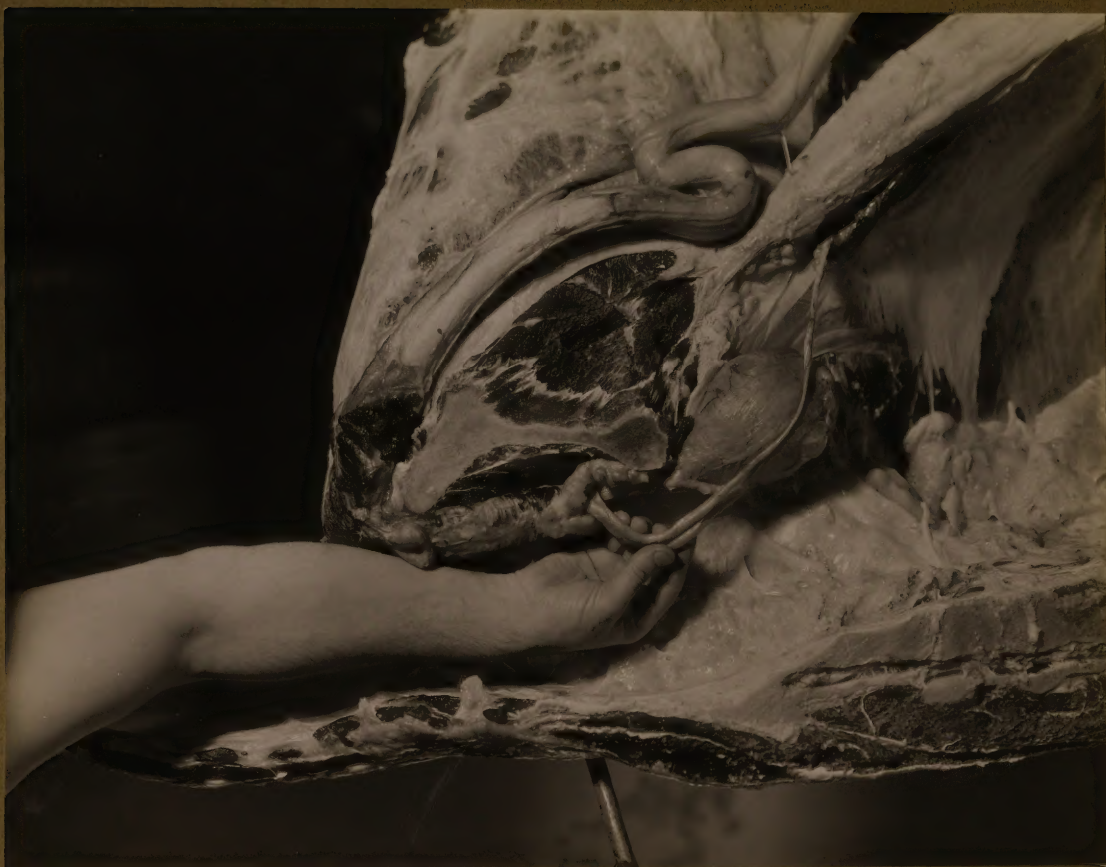


m-2152

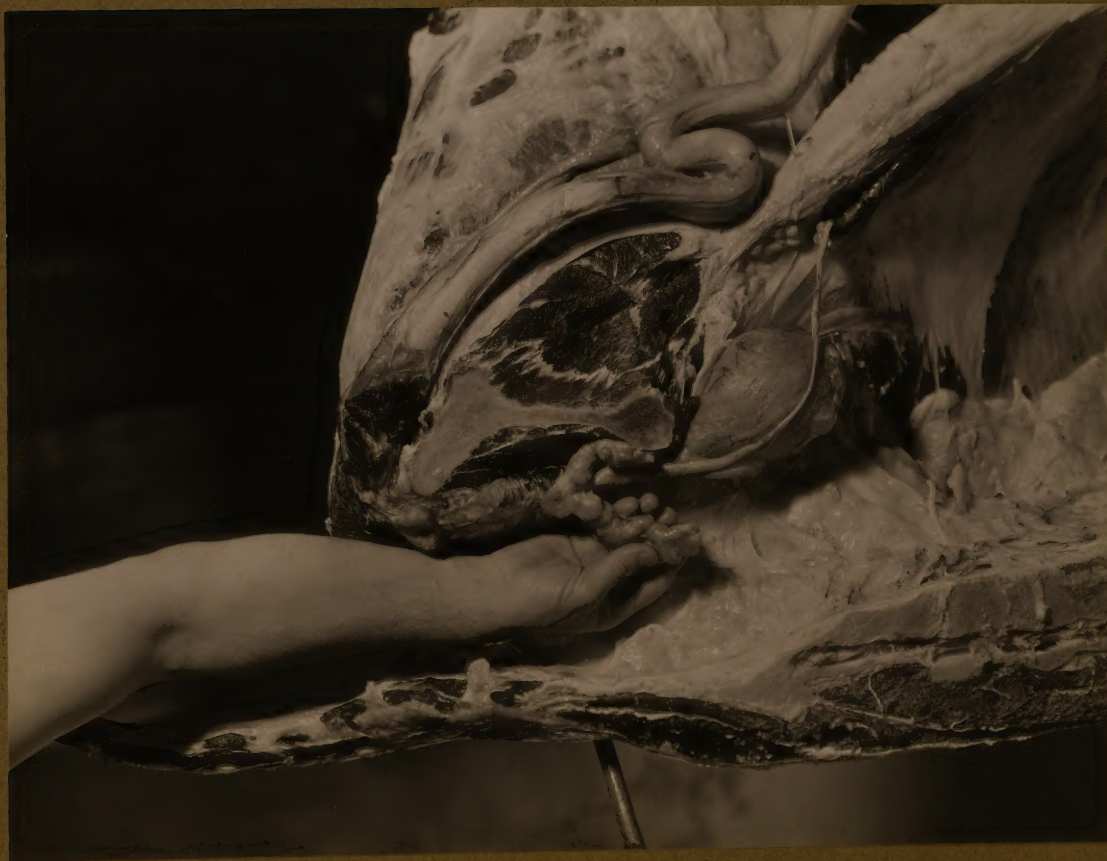


m-2153

m. 2155



m. 2154





X 3877



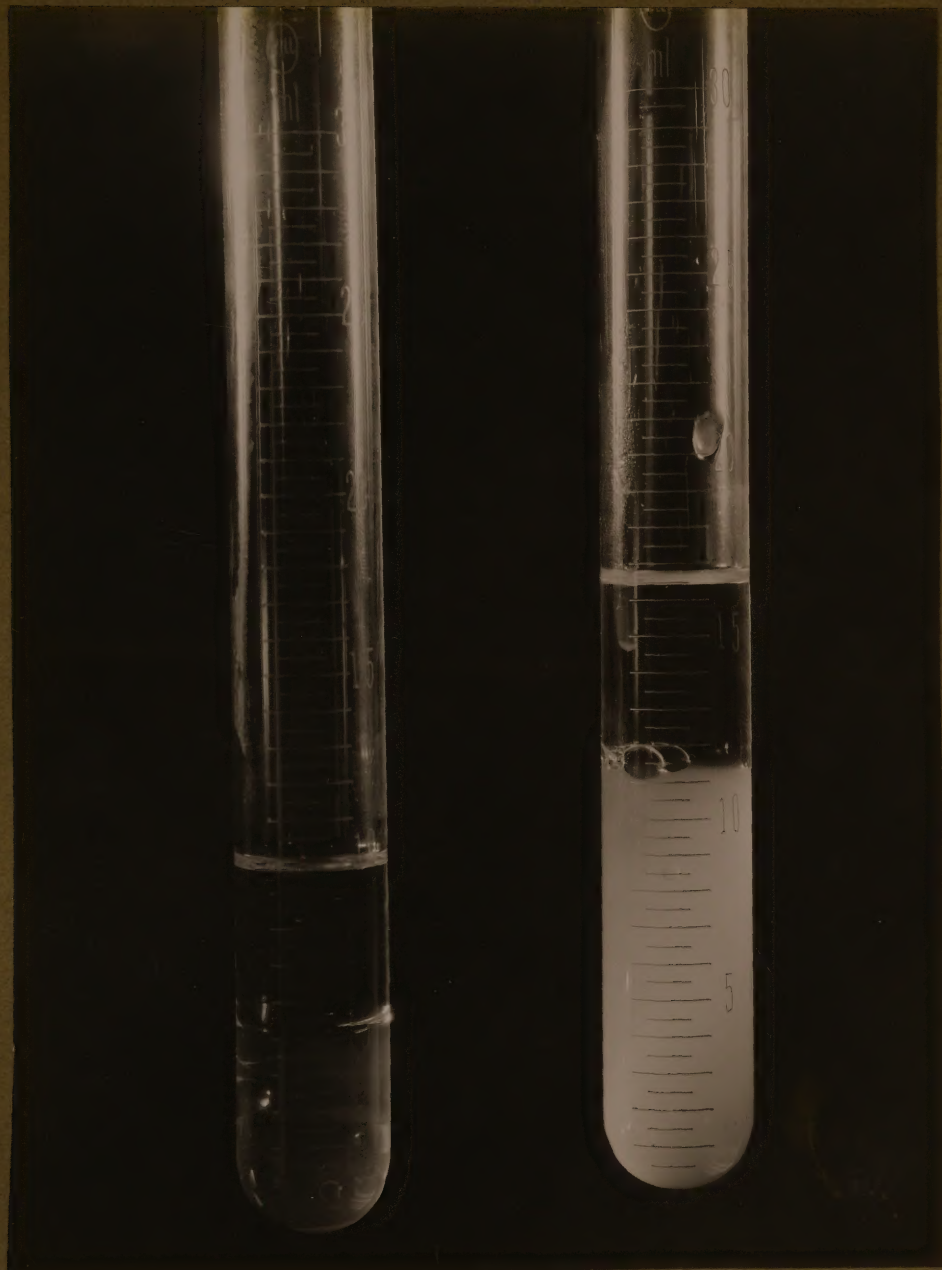
m. 2151



m. 2148



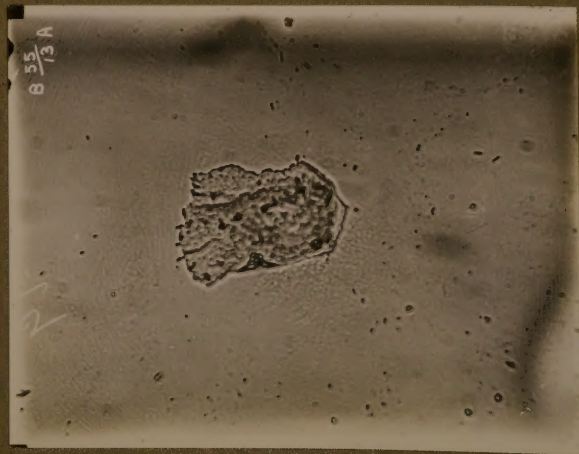
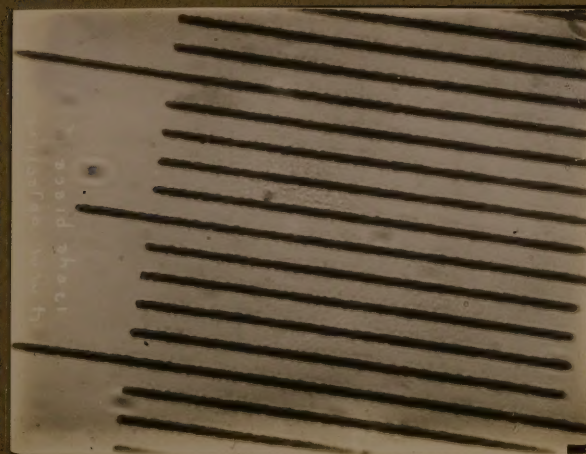
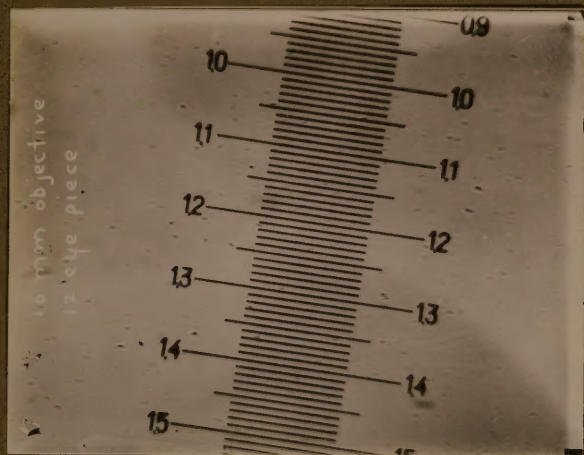
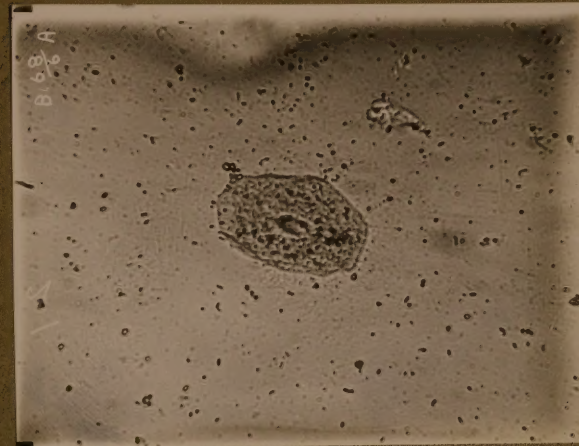
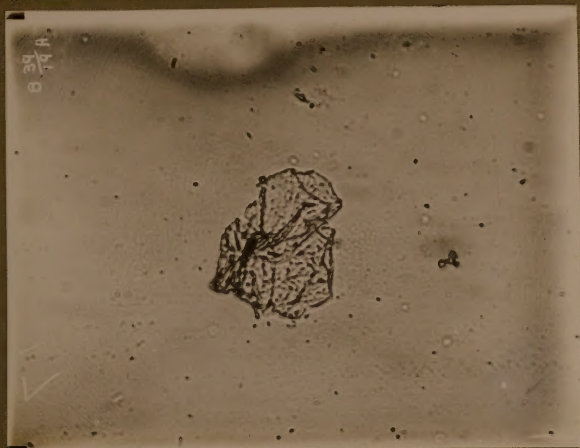
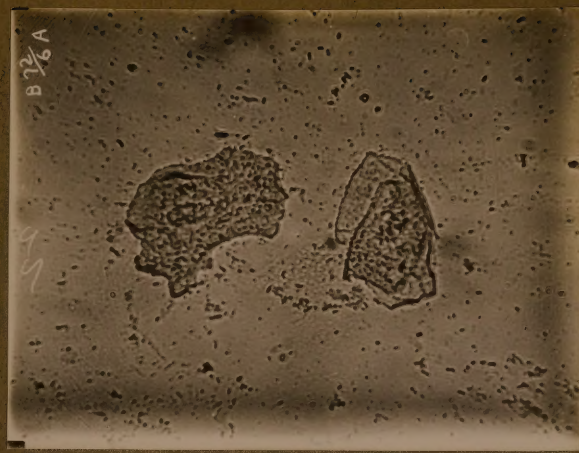
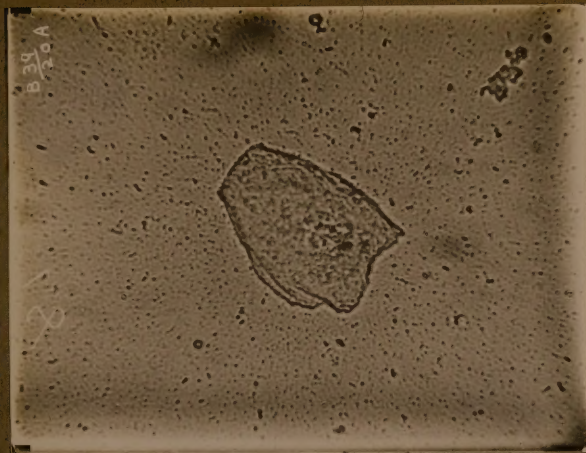
m. 2149

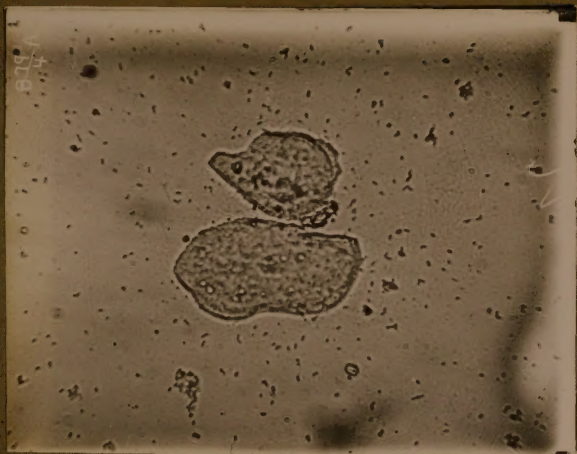


X 3878



X 3879

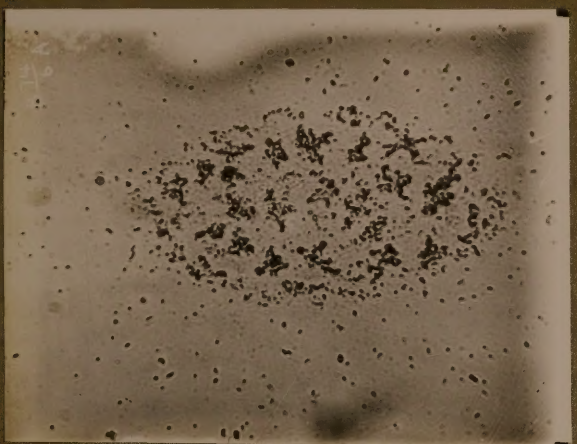




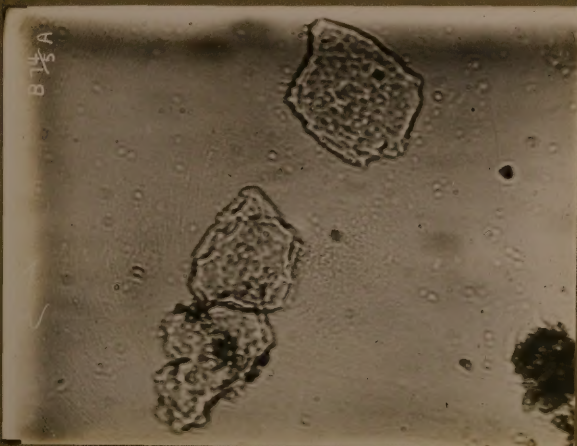
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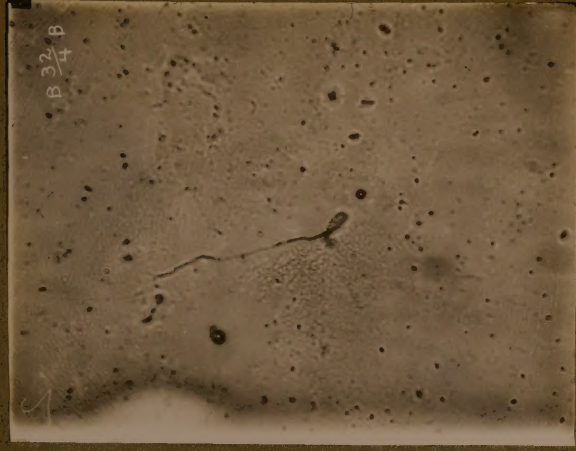
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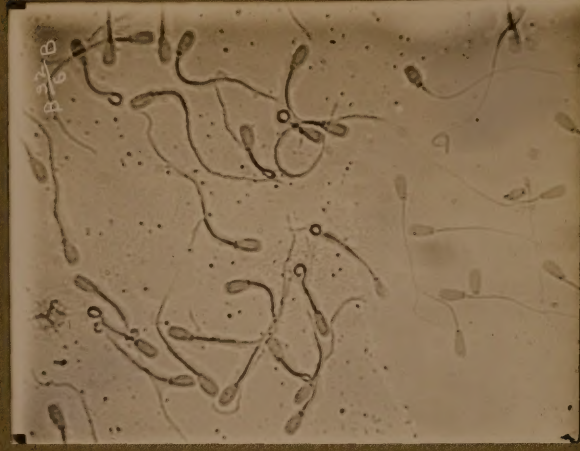
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72544



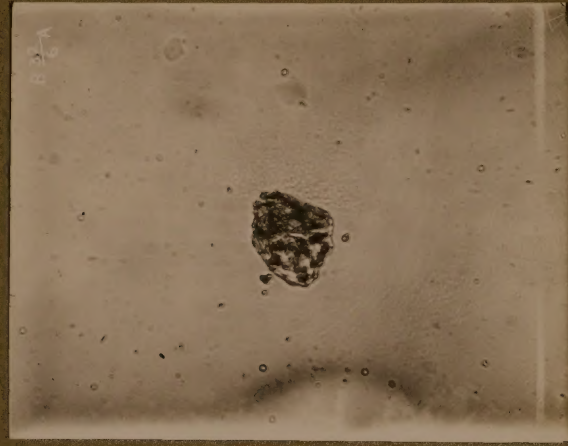
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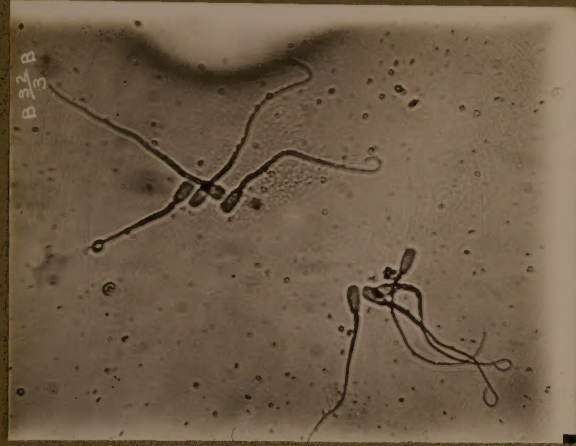
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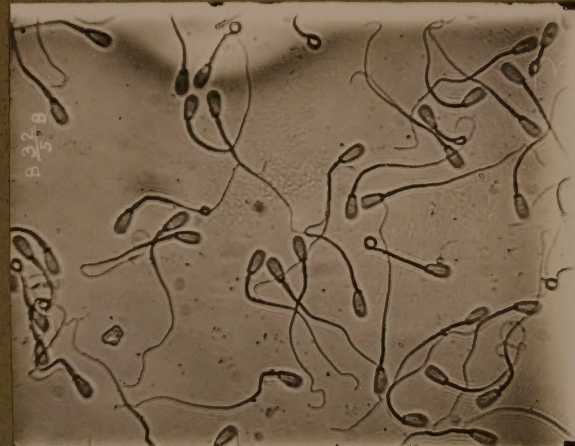
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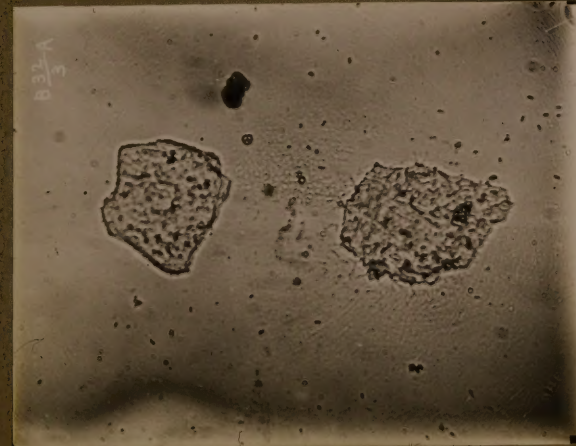
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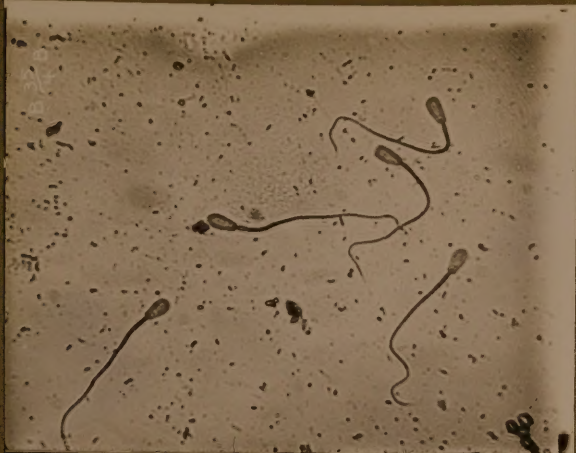
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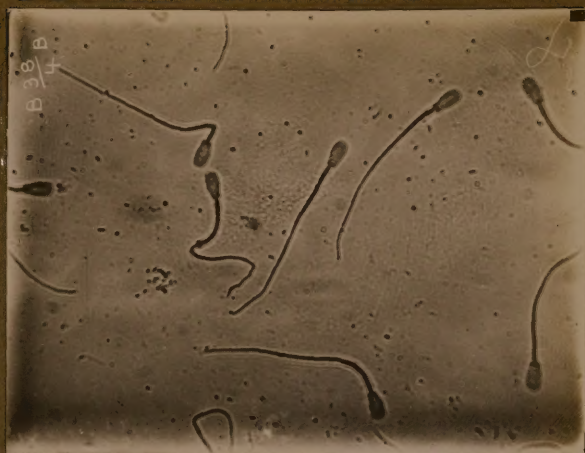
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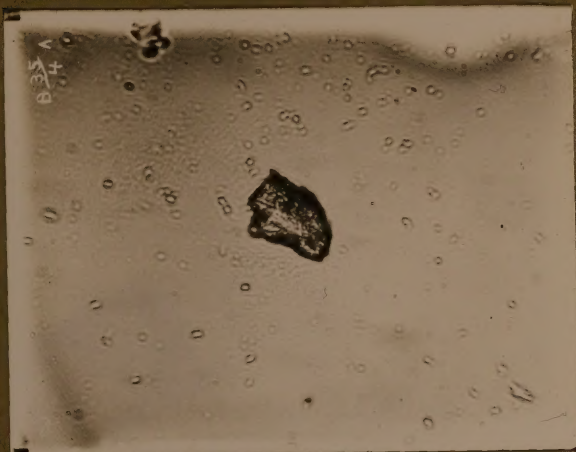
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92530



92532



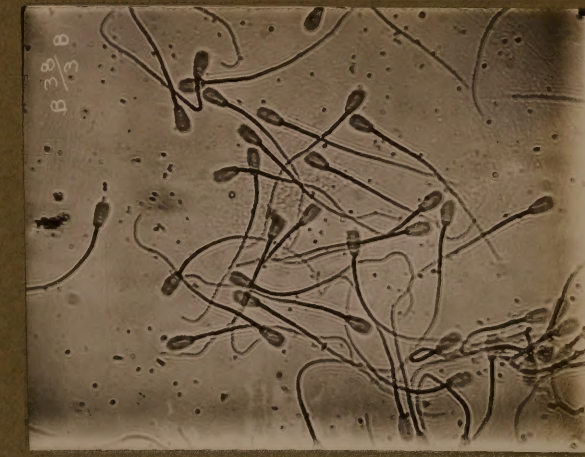
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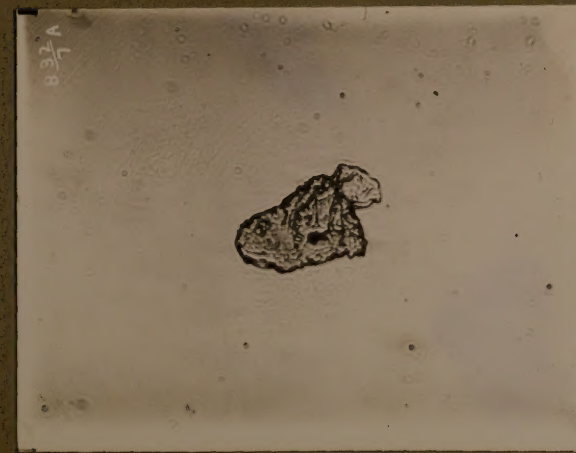
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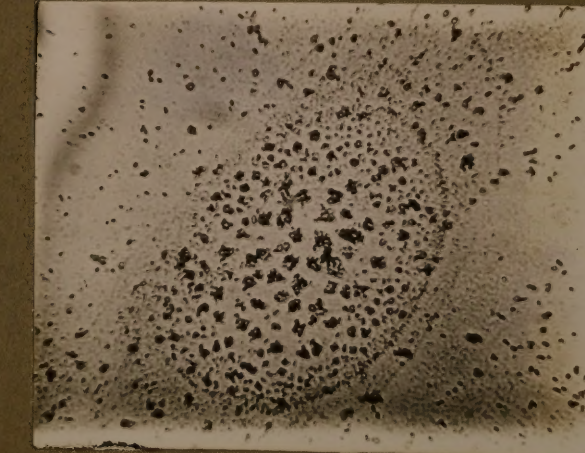
92529



92531



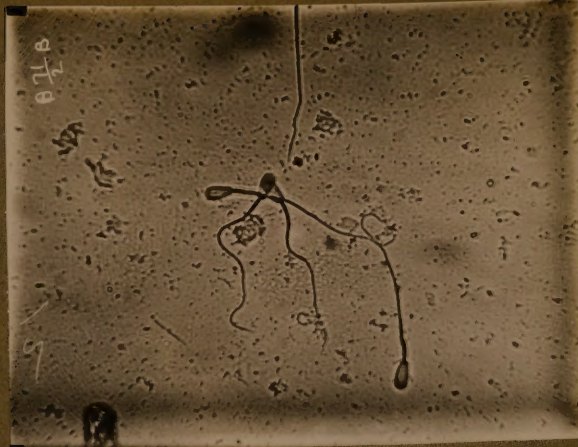
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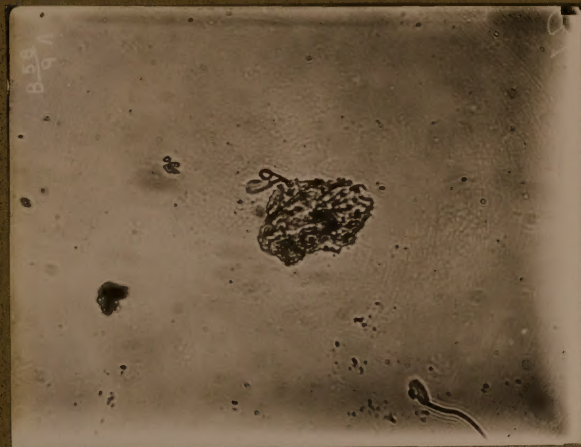
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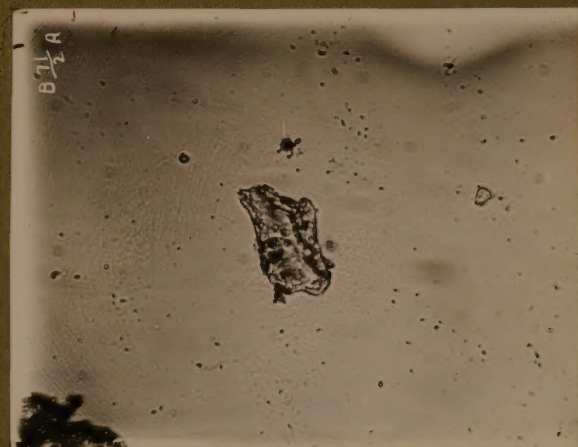
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92534



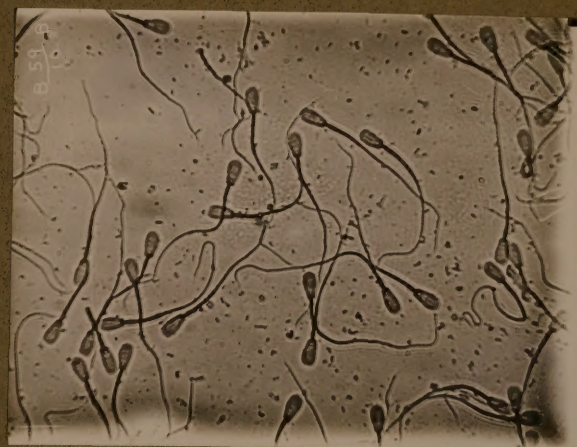
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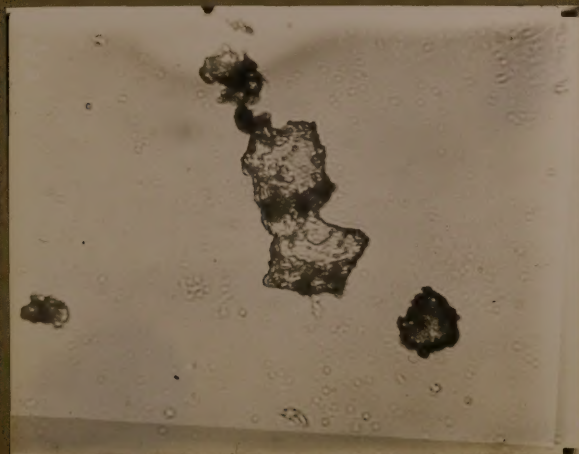
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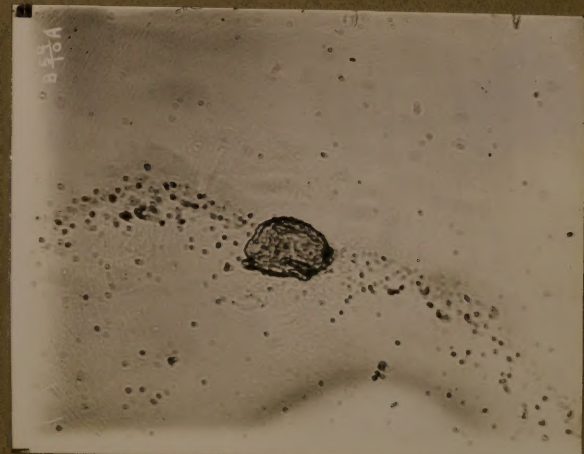
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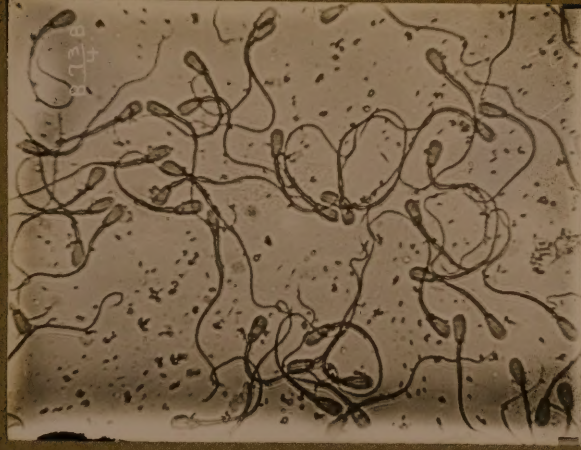
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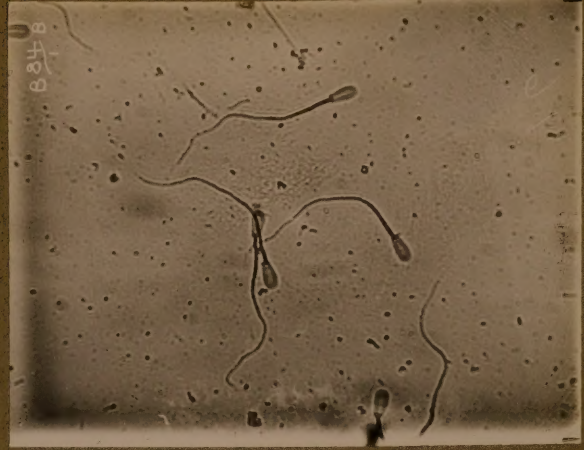
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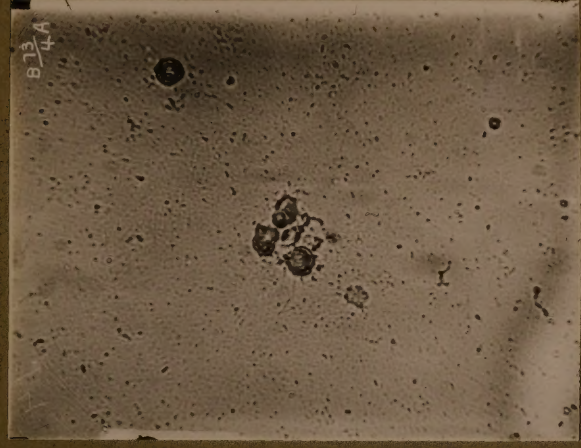
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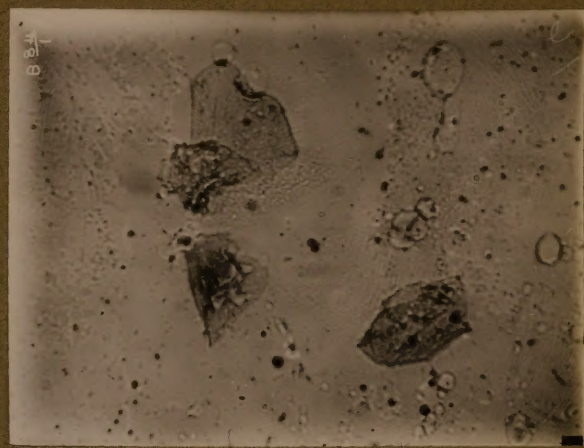
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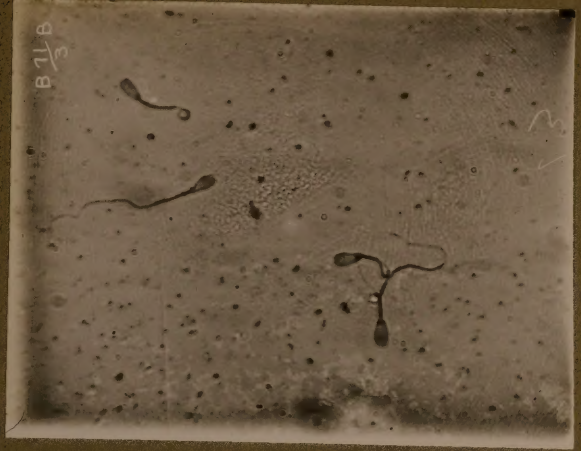
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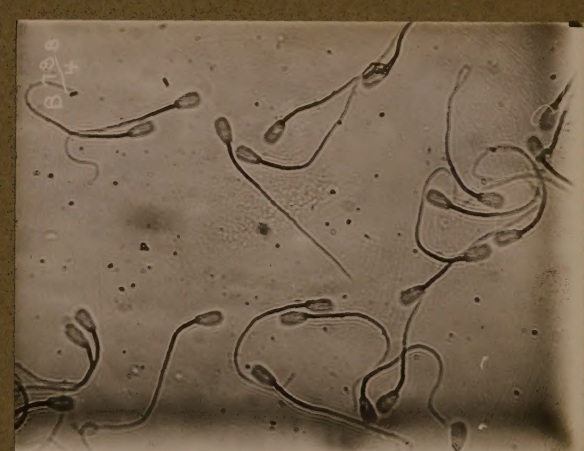
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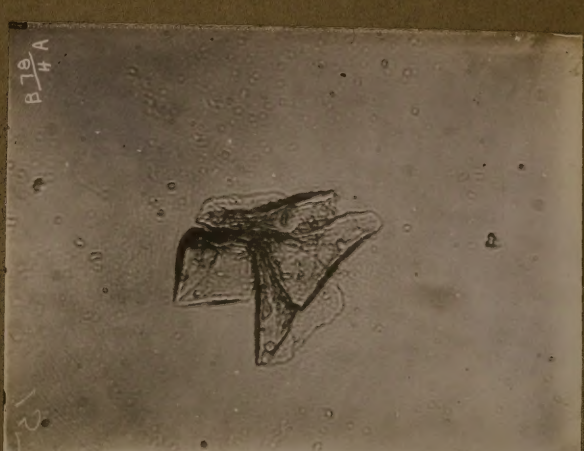
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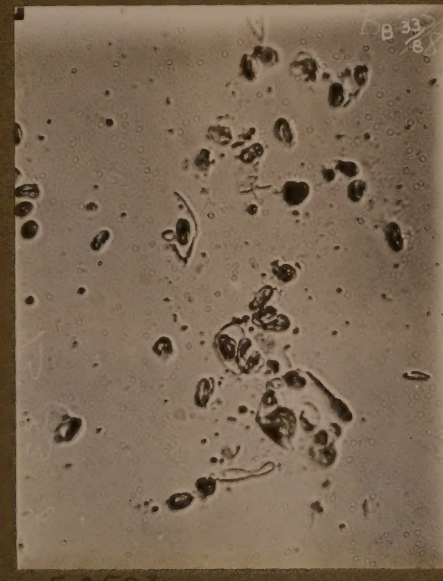
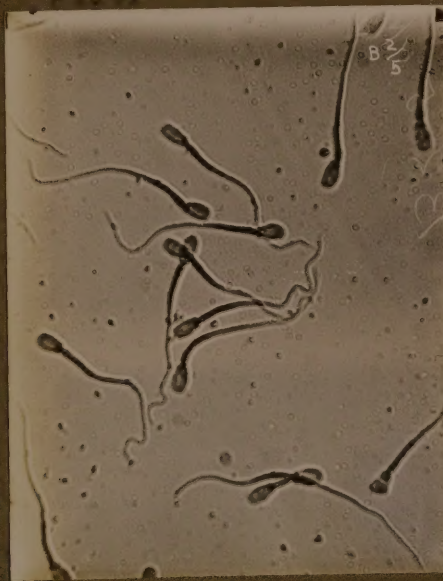
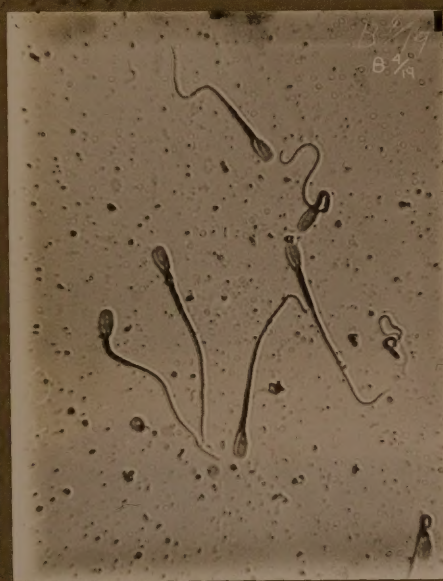
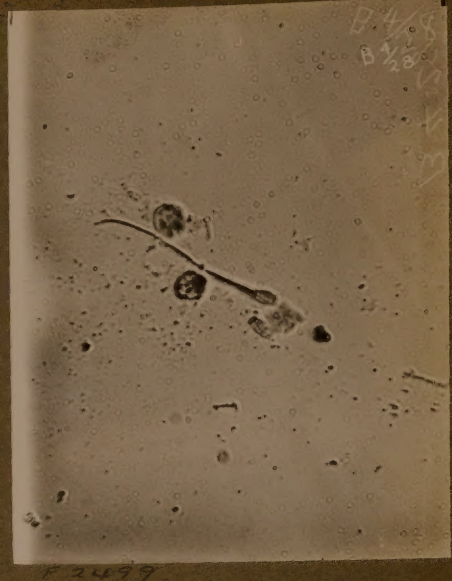
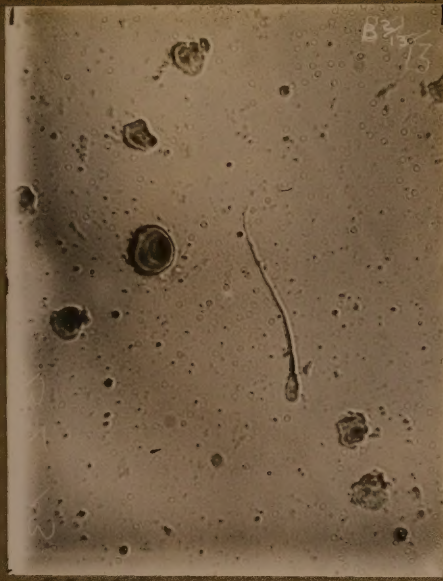
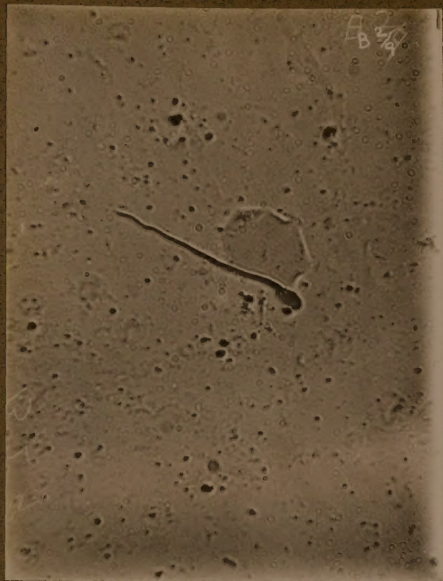
72535



72512



72510

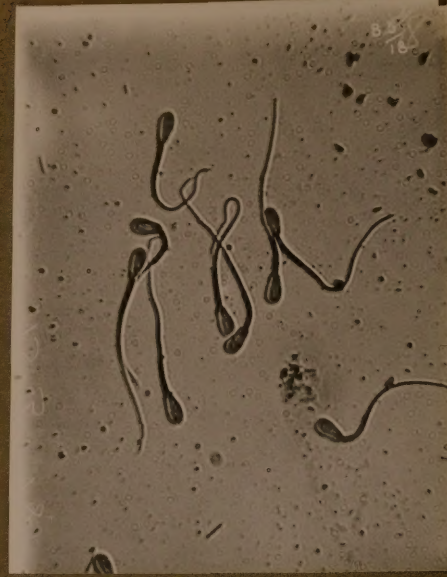




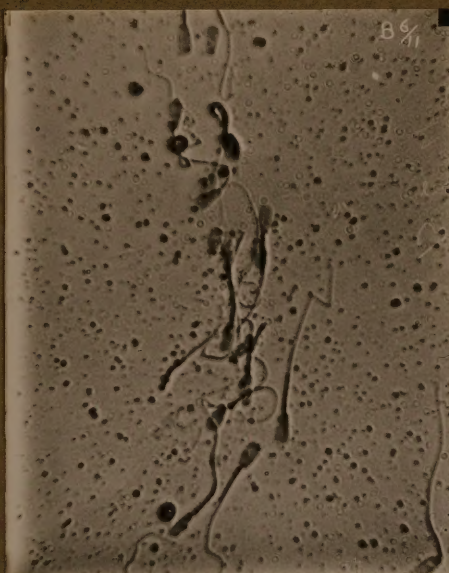
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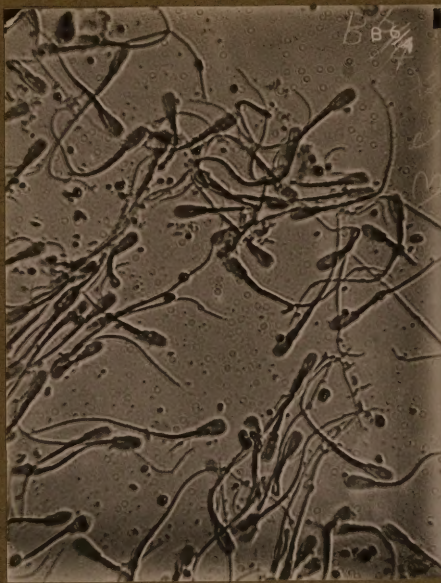
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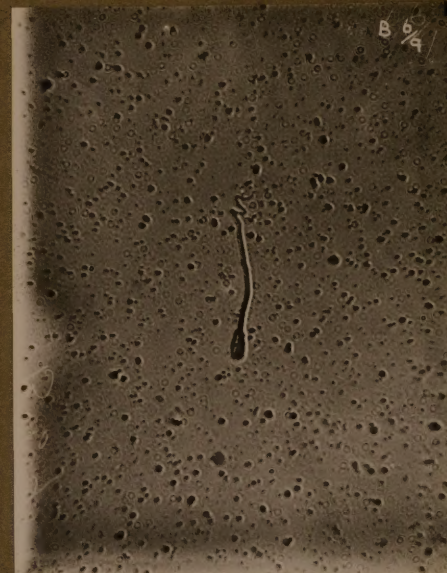
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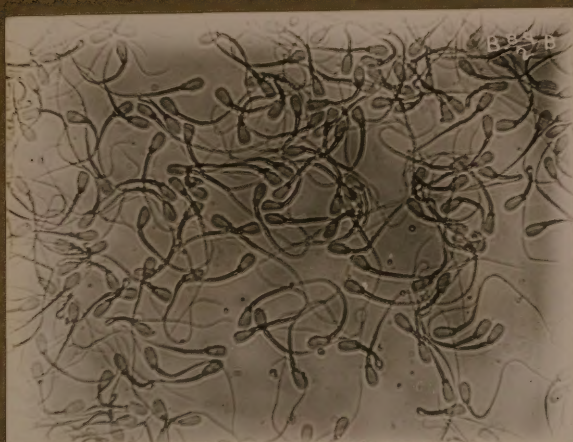
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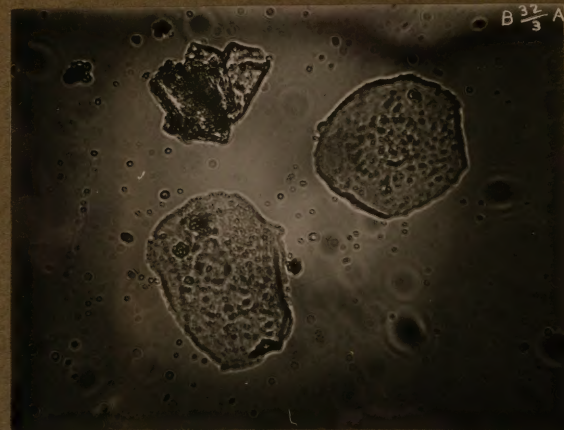
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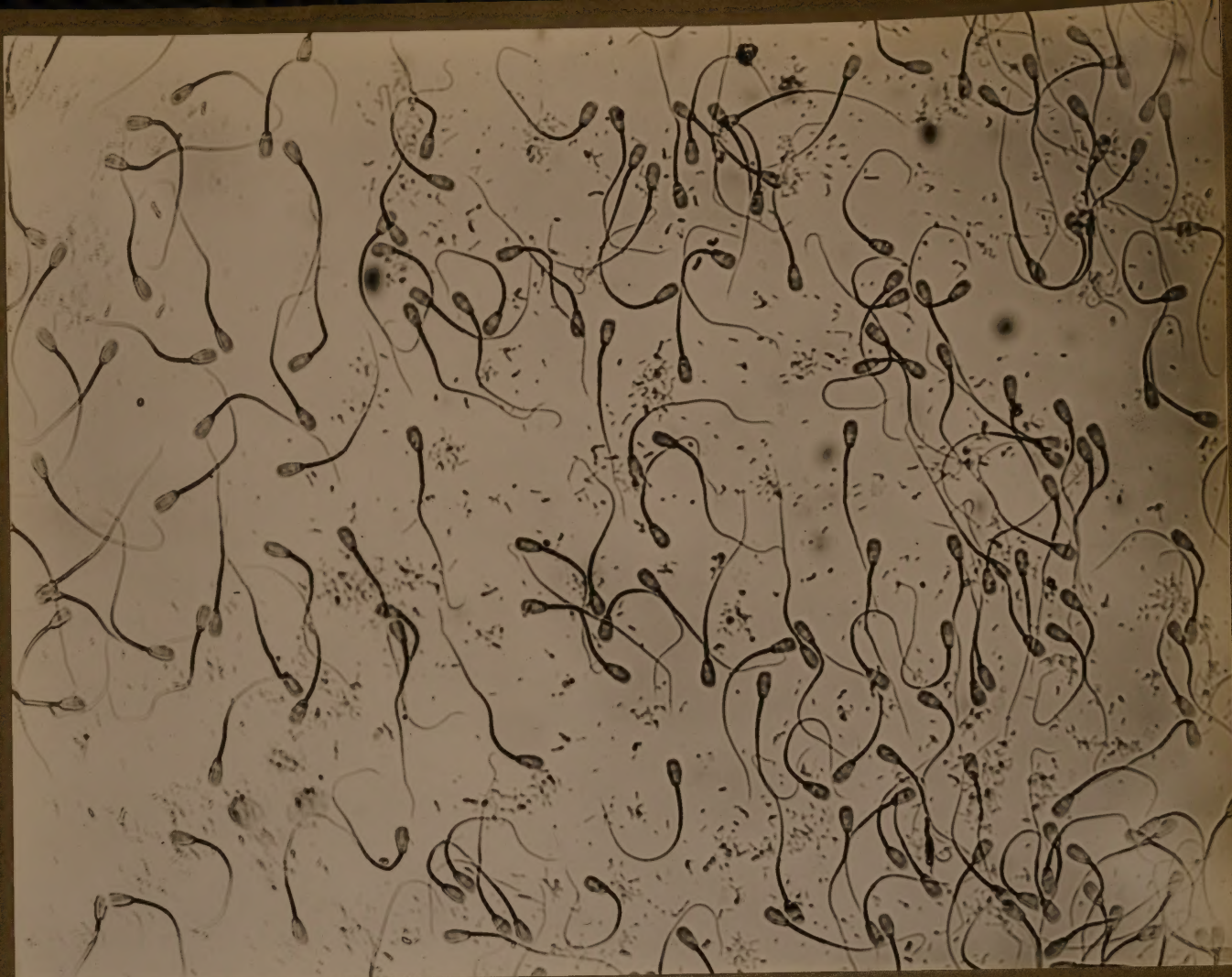
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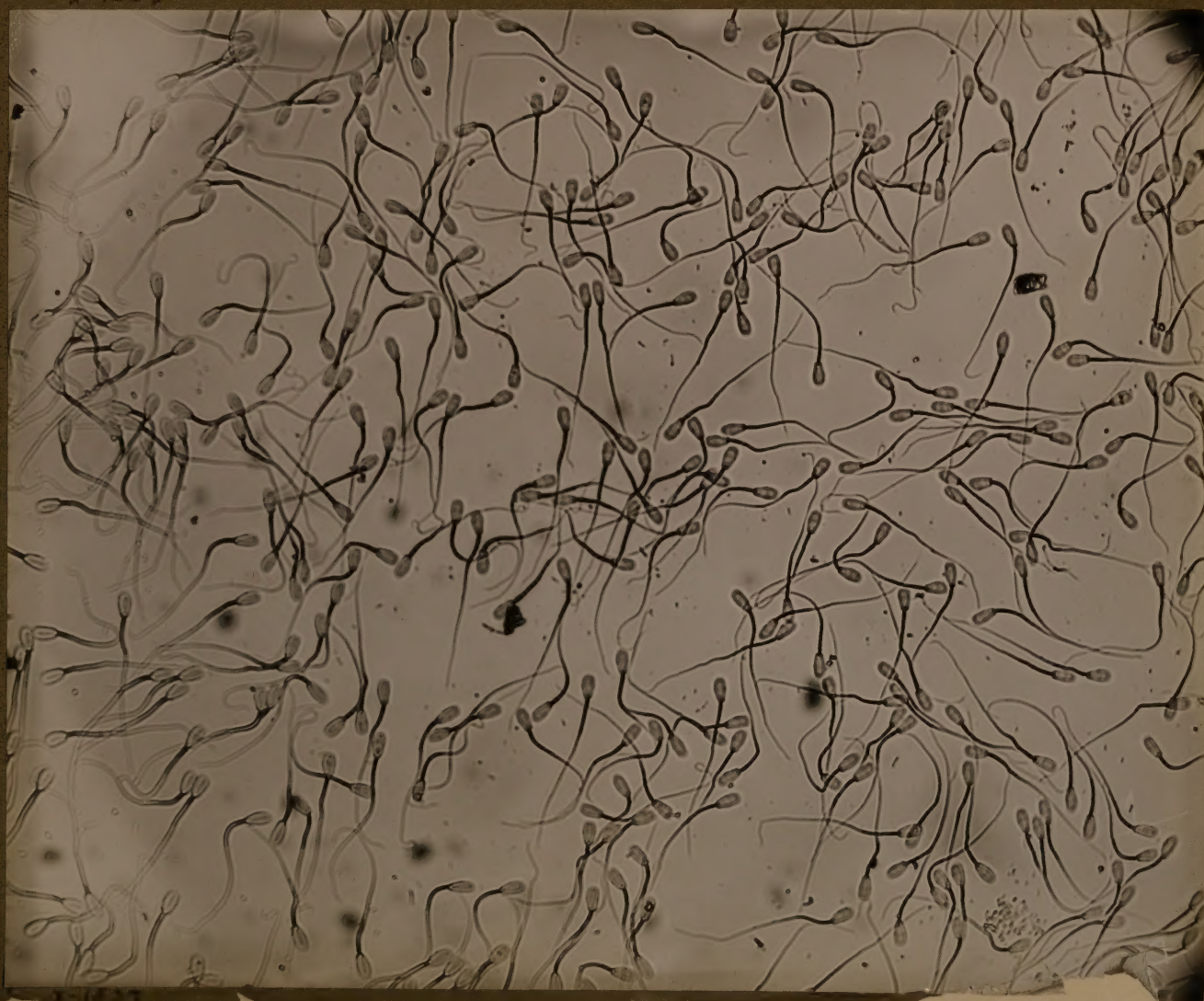
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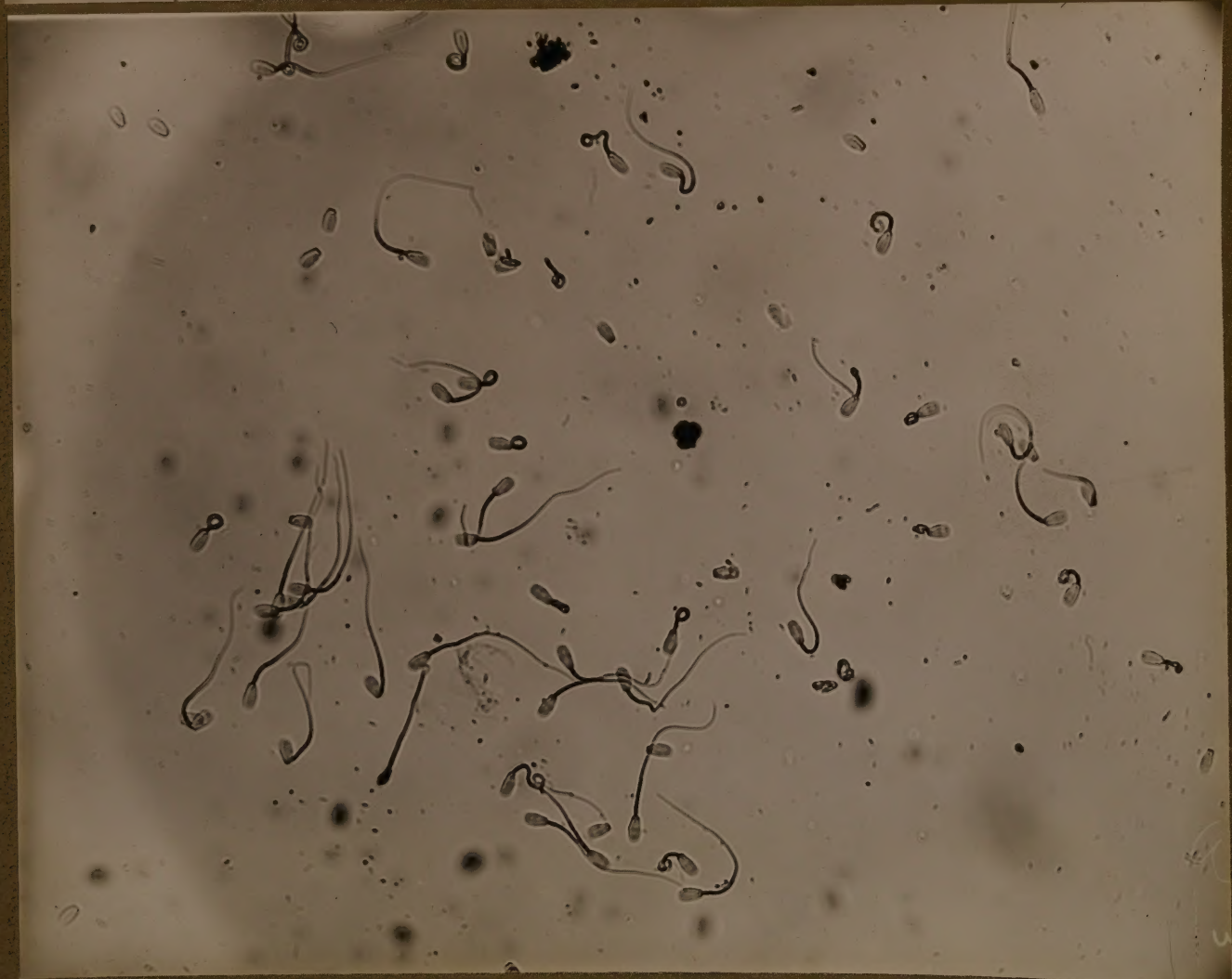
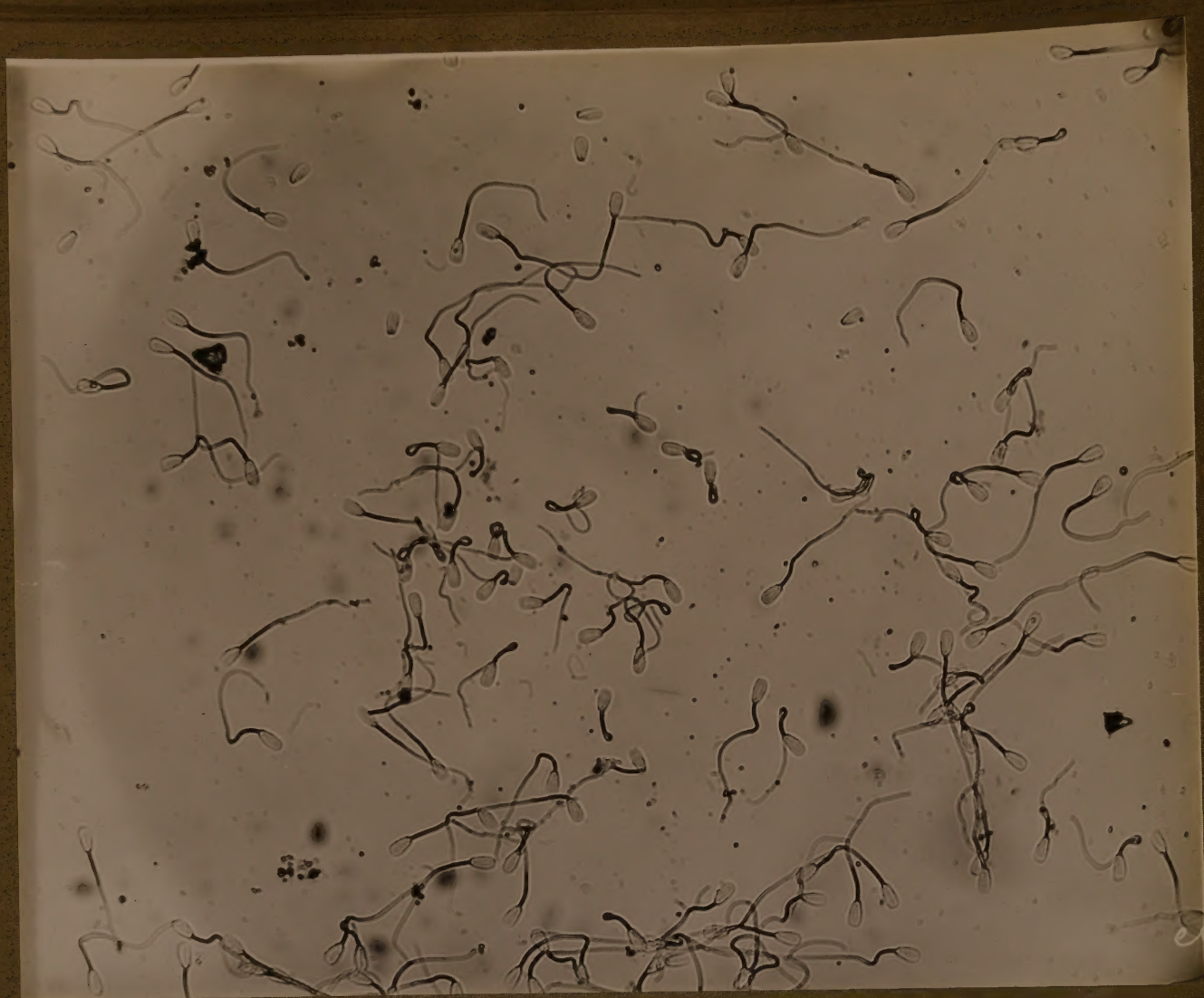


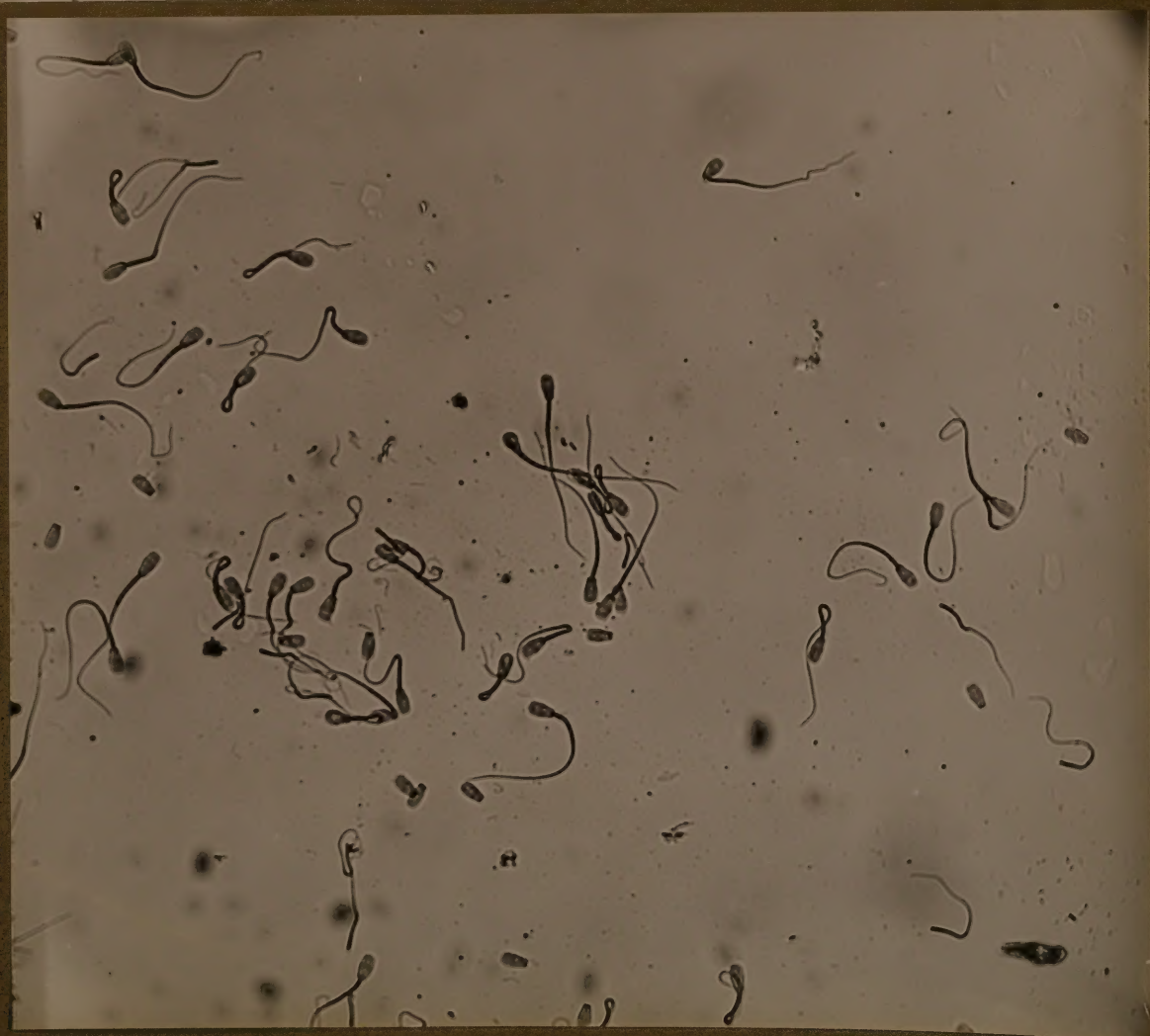
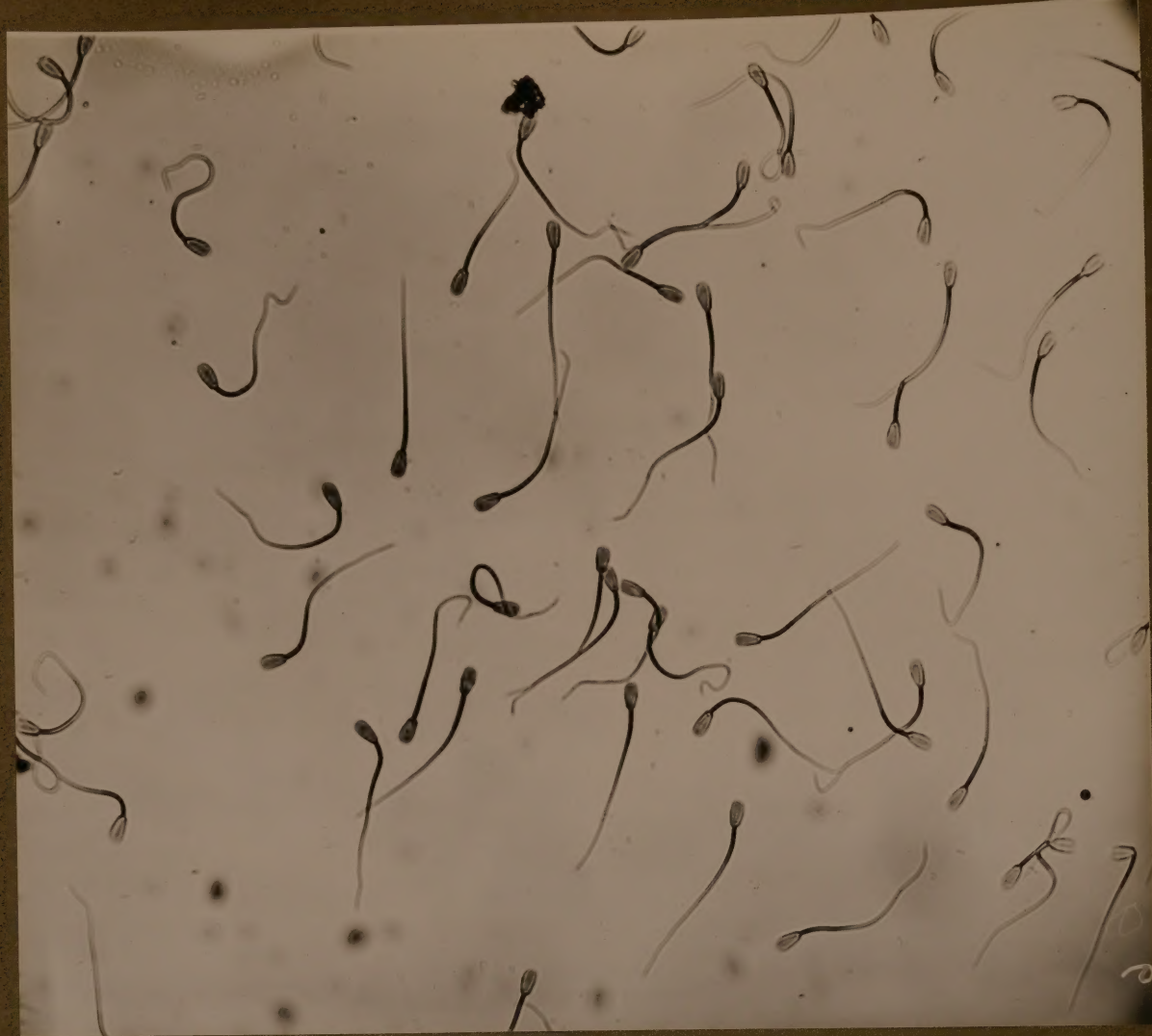
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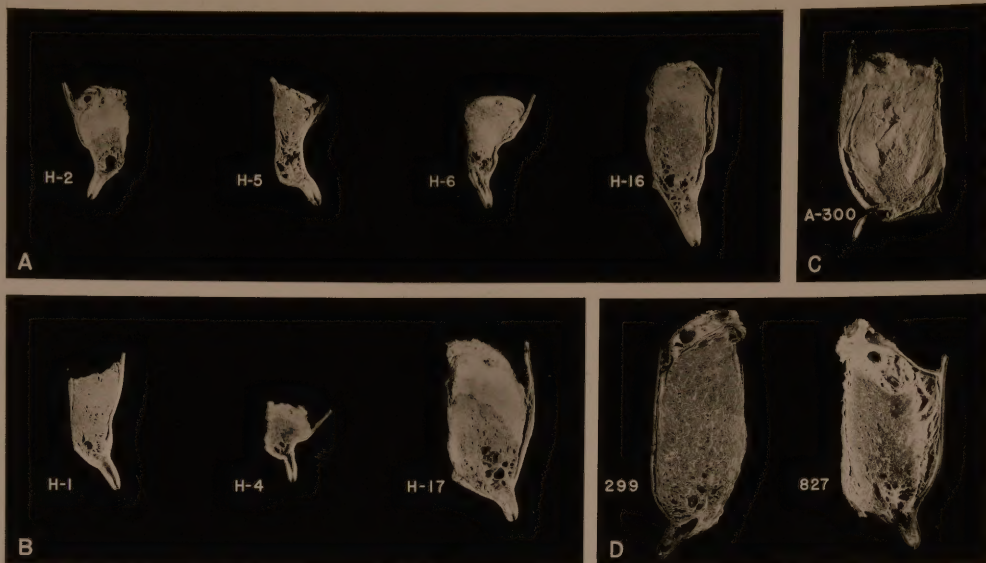


X-1534

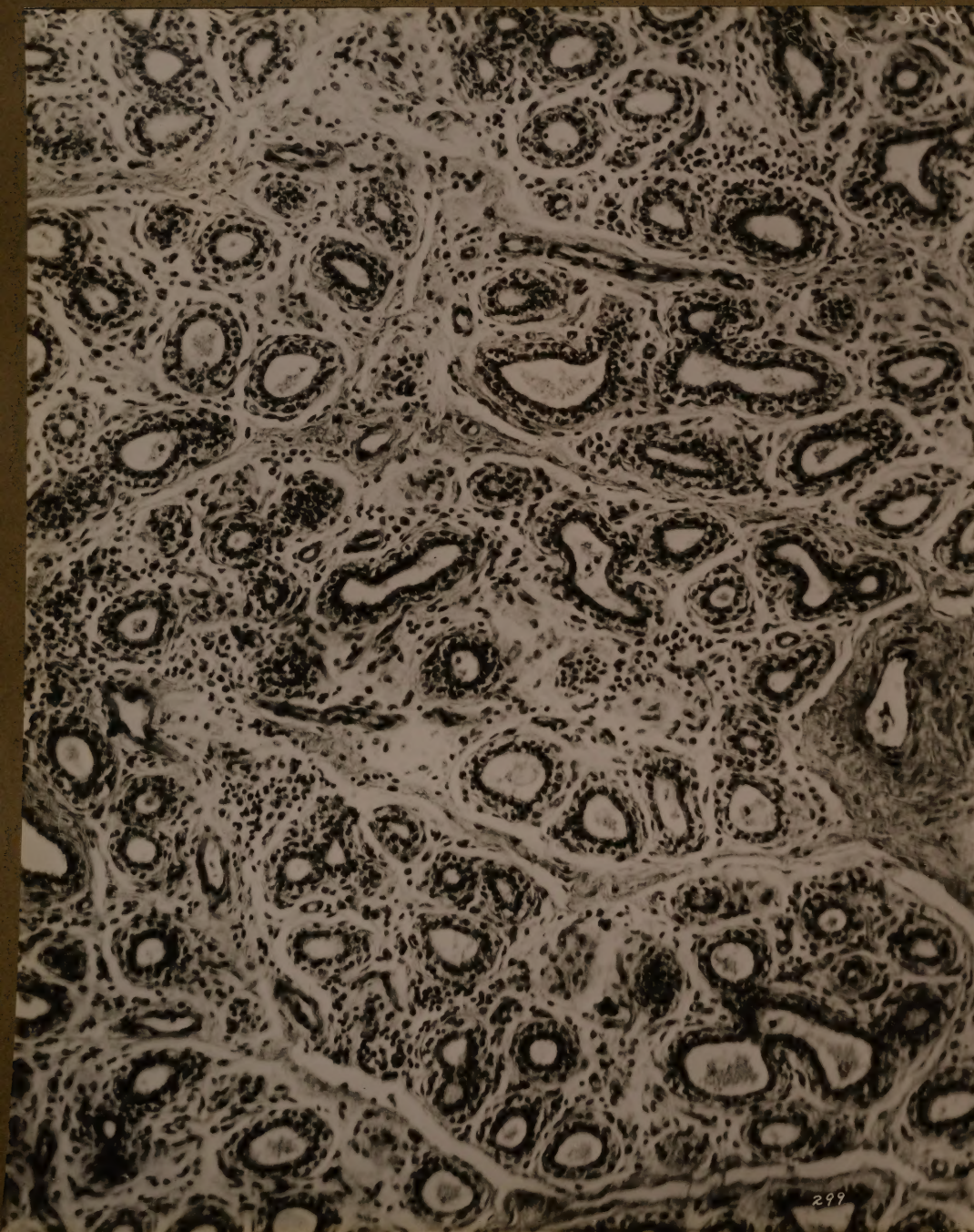




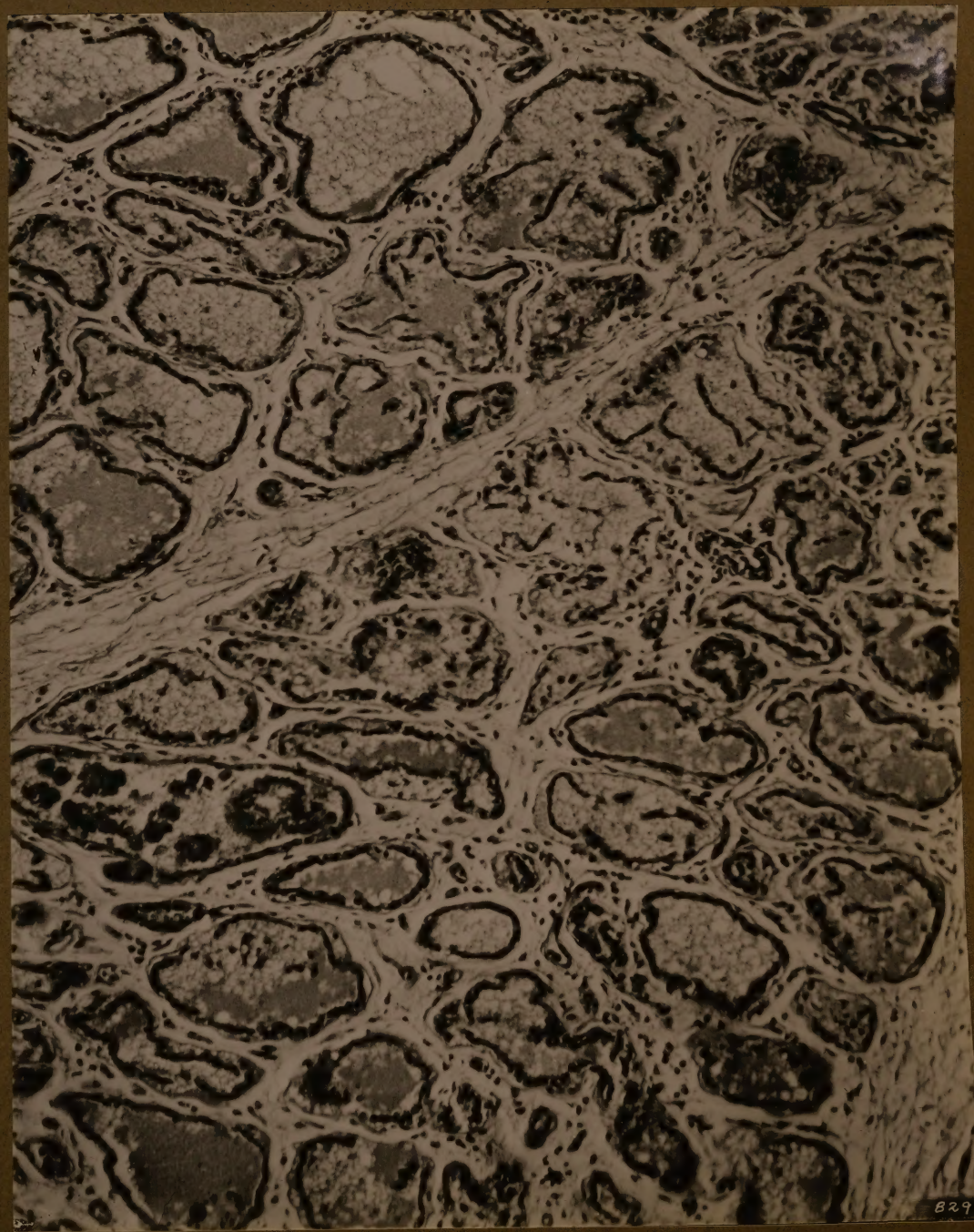




X 3618



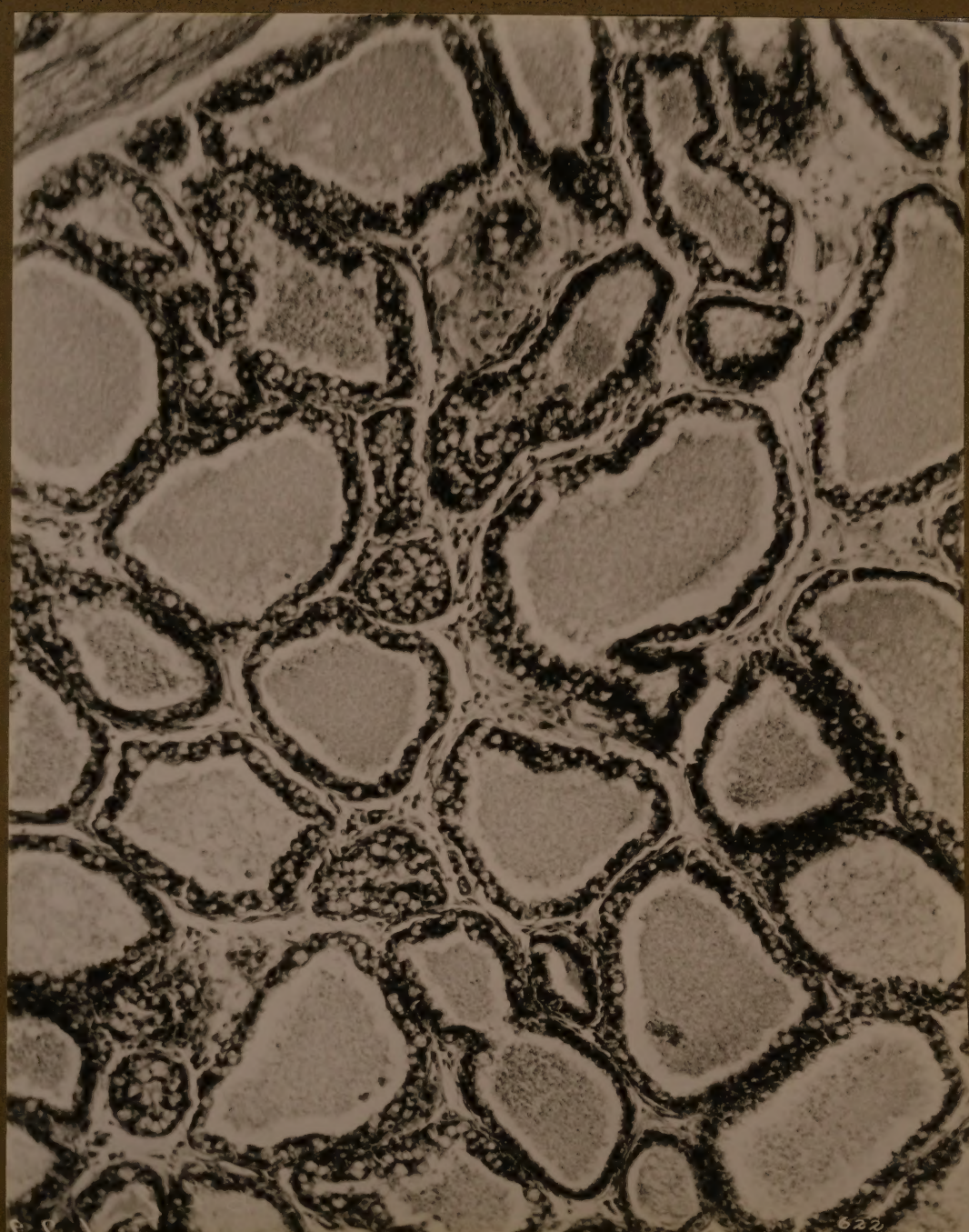
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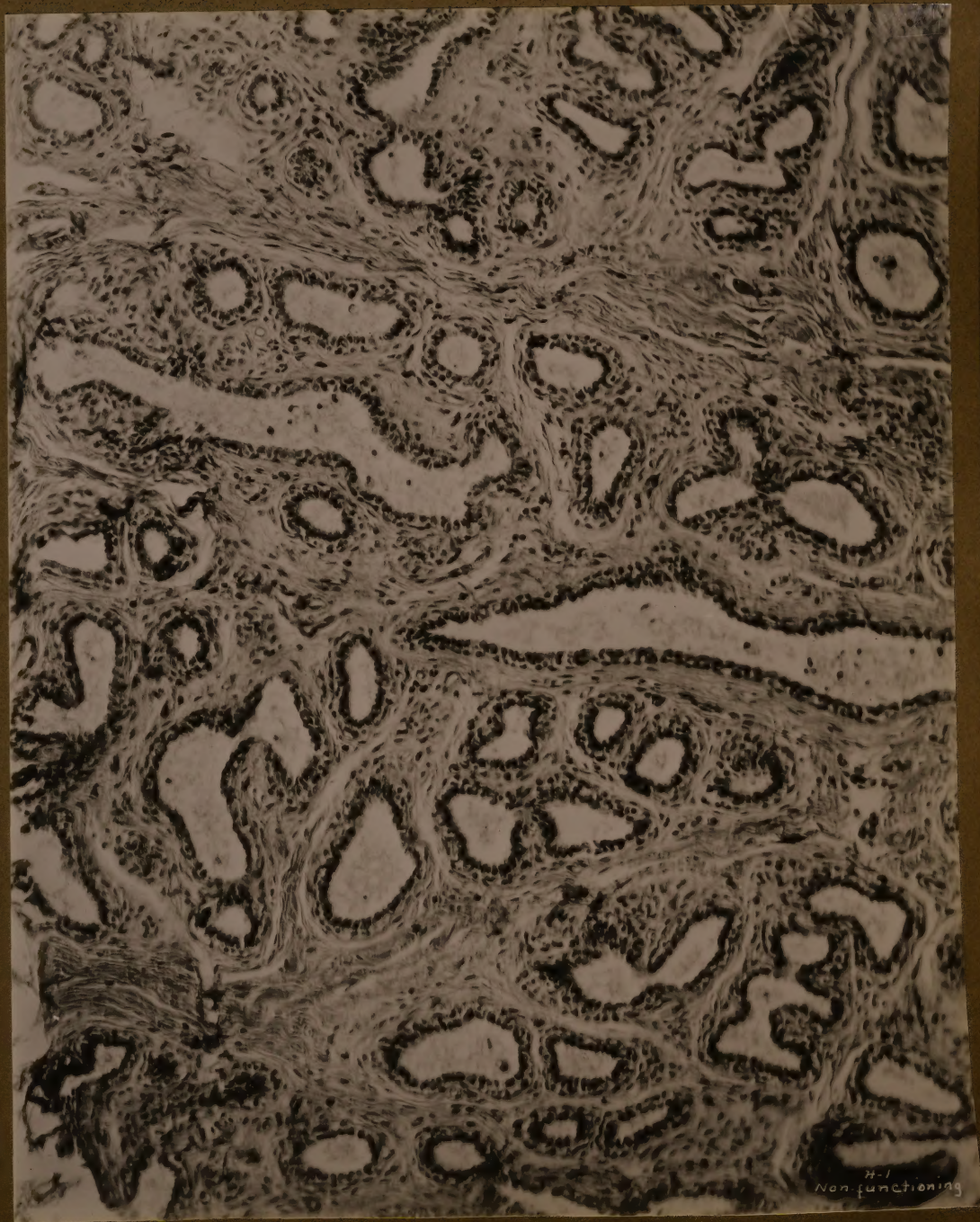
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X3458



X3460



X3463

X3462



X3464

H-2

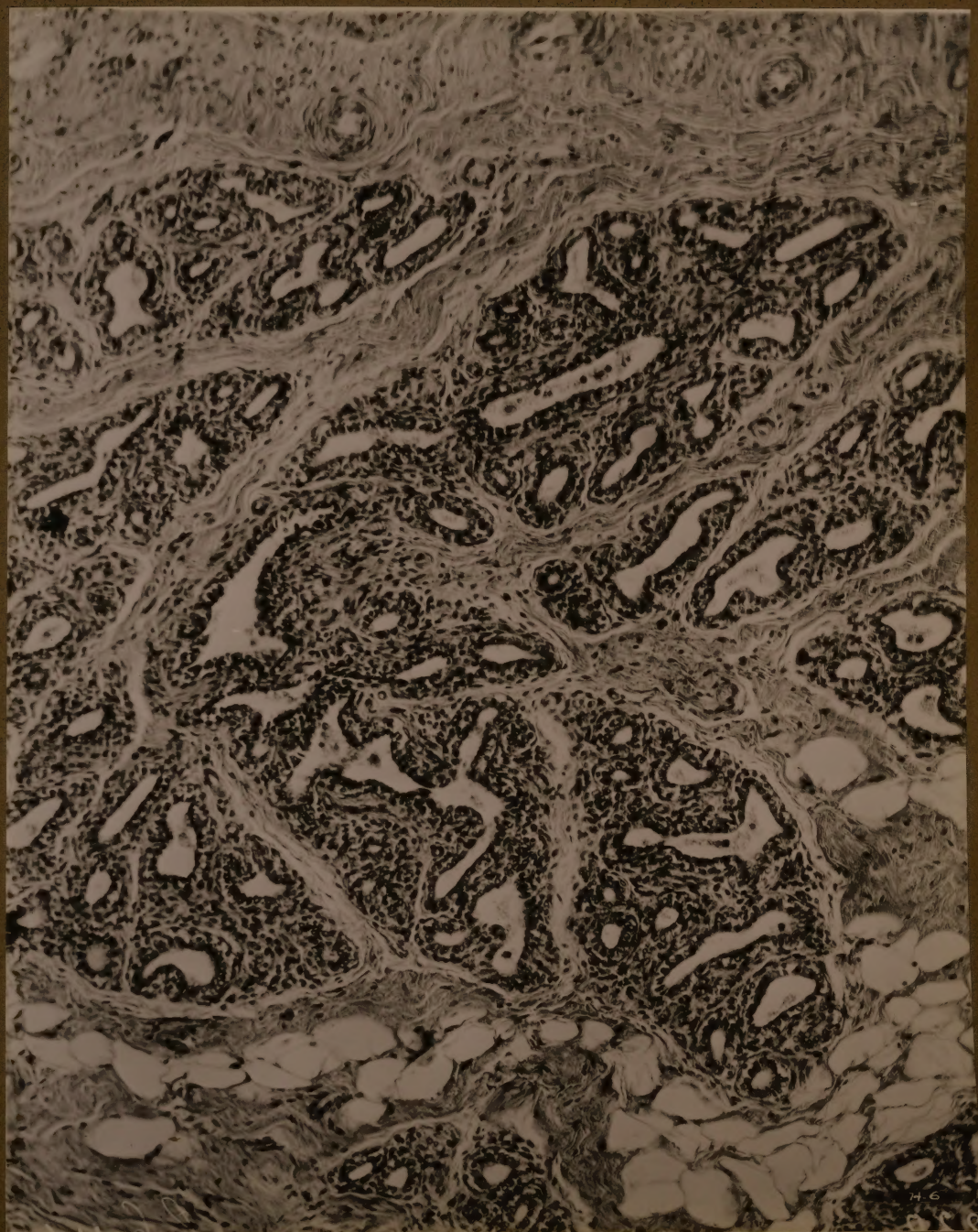


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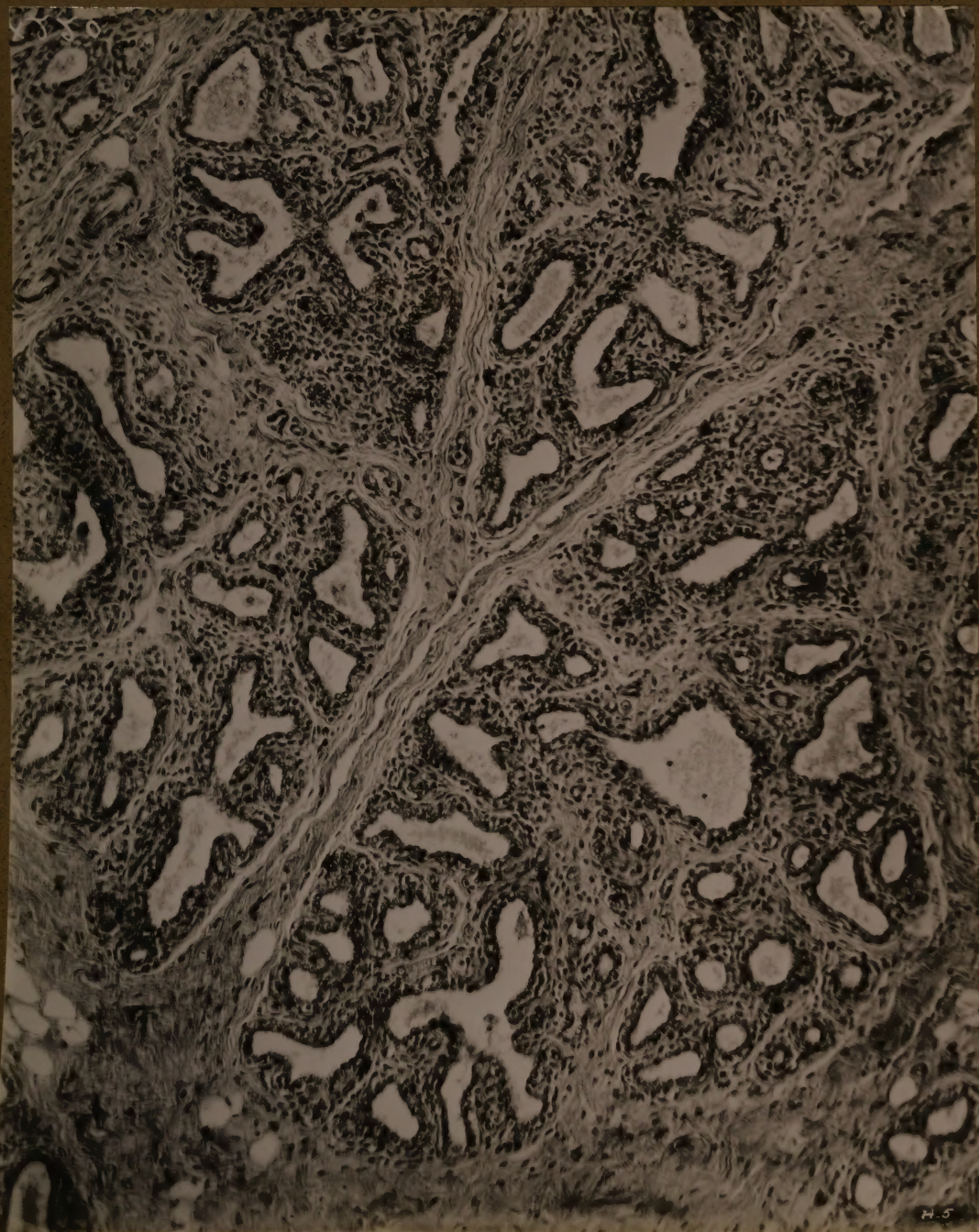
H-2



X3466

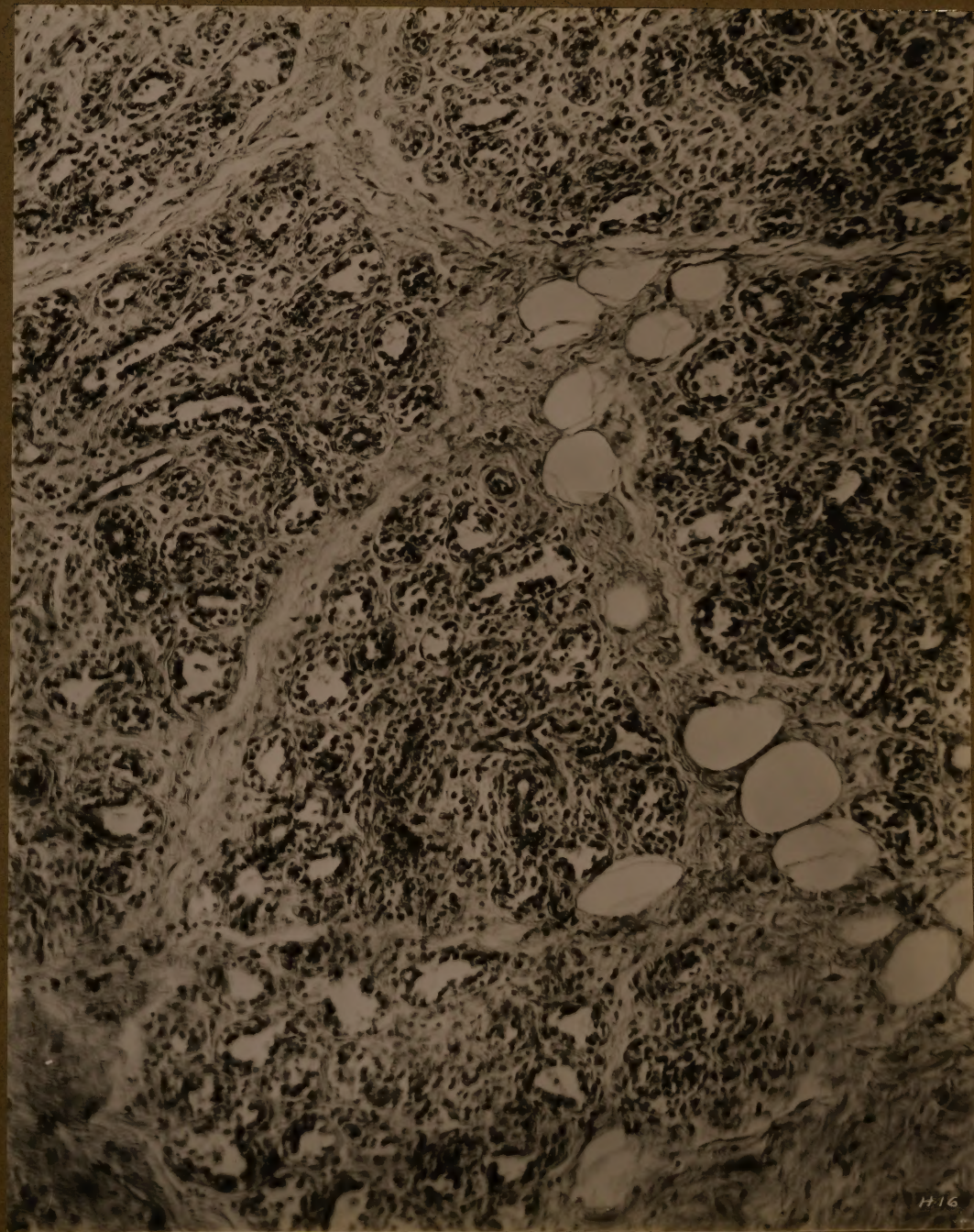


X3467





V3470



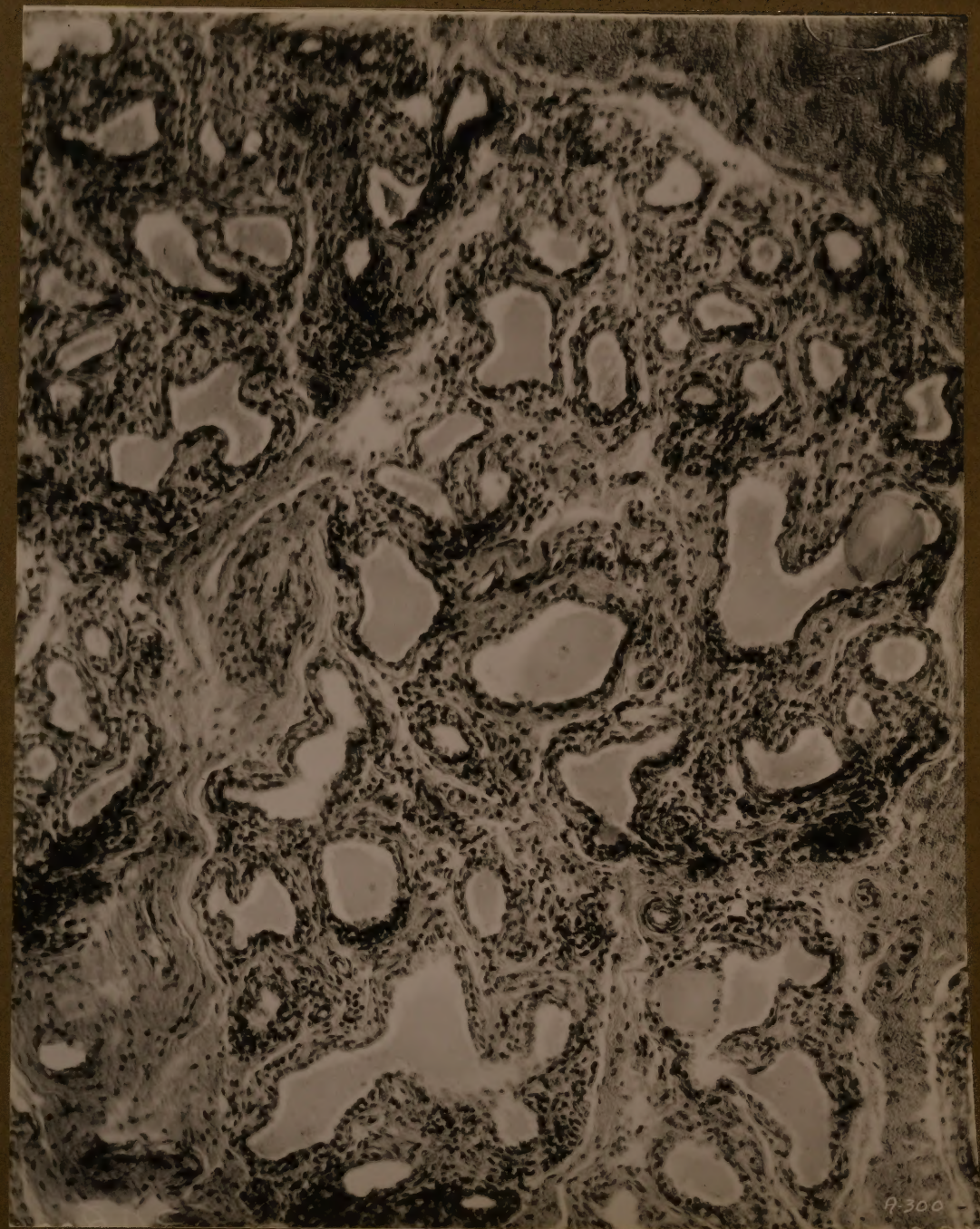
X3471

H16



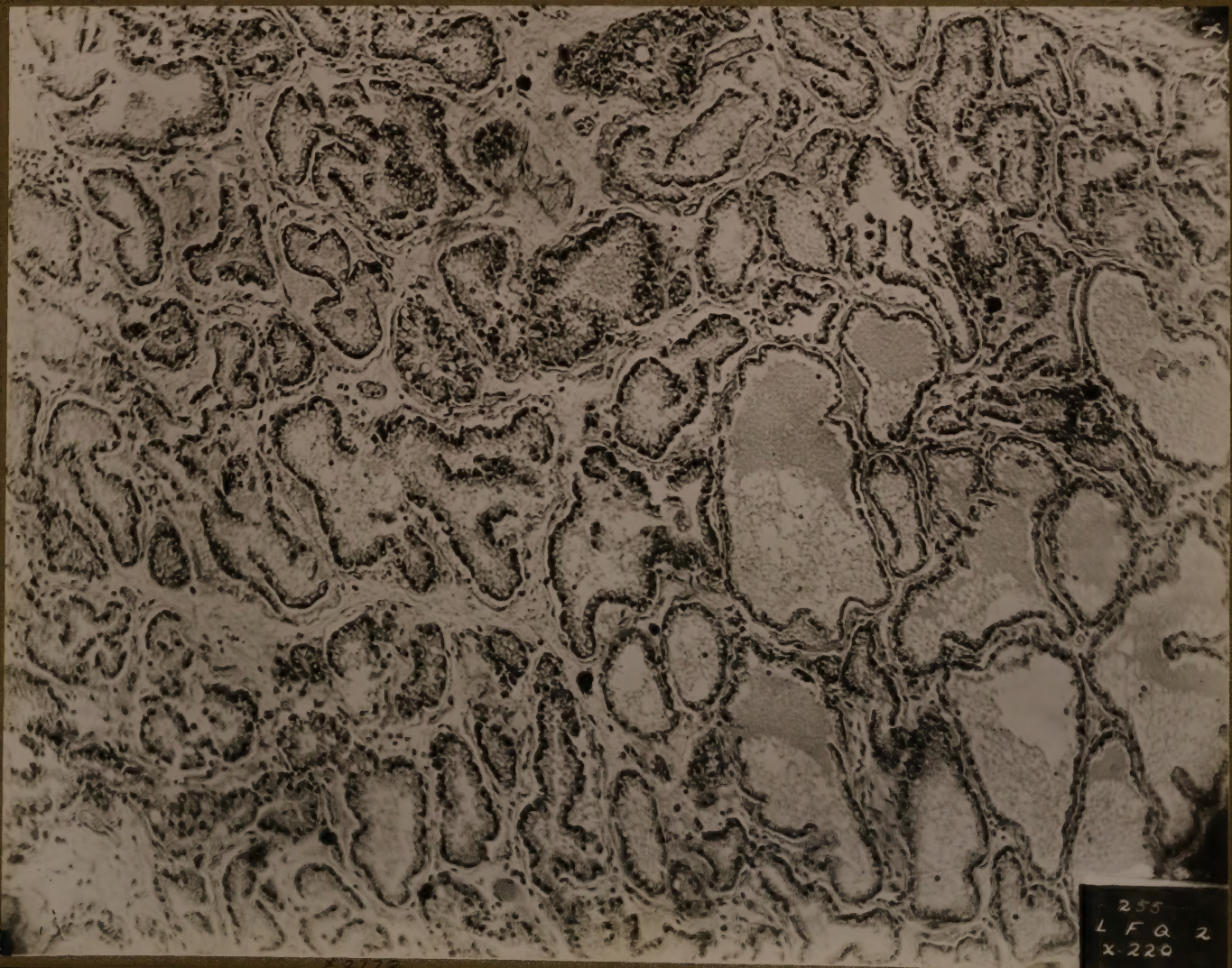
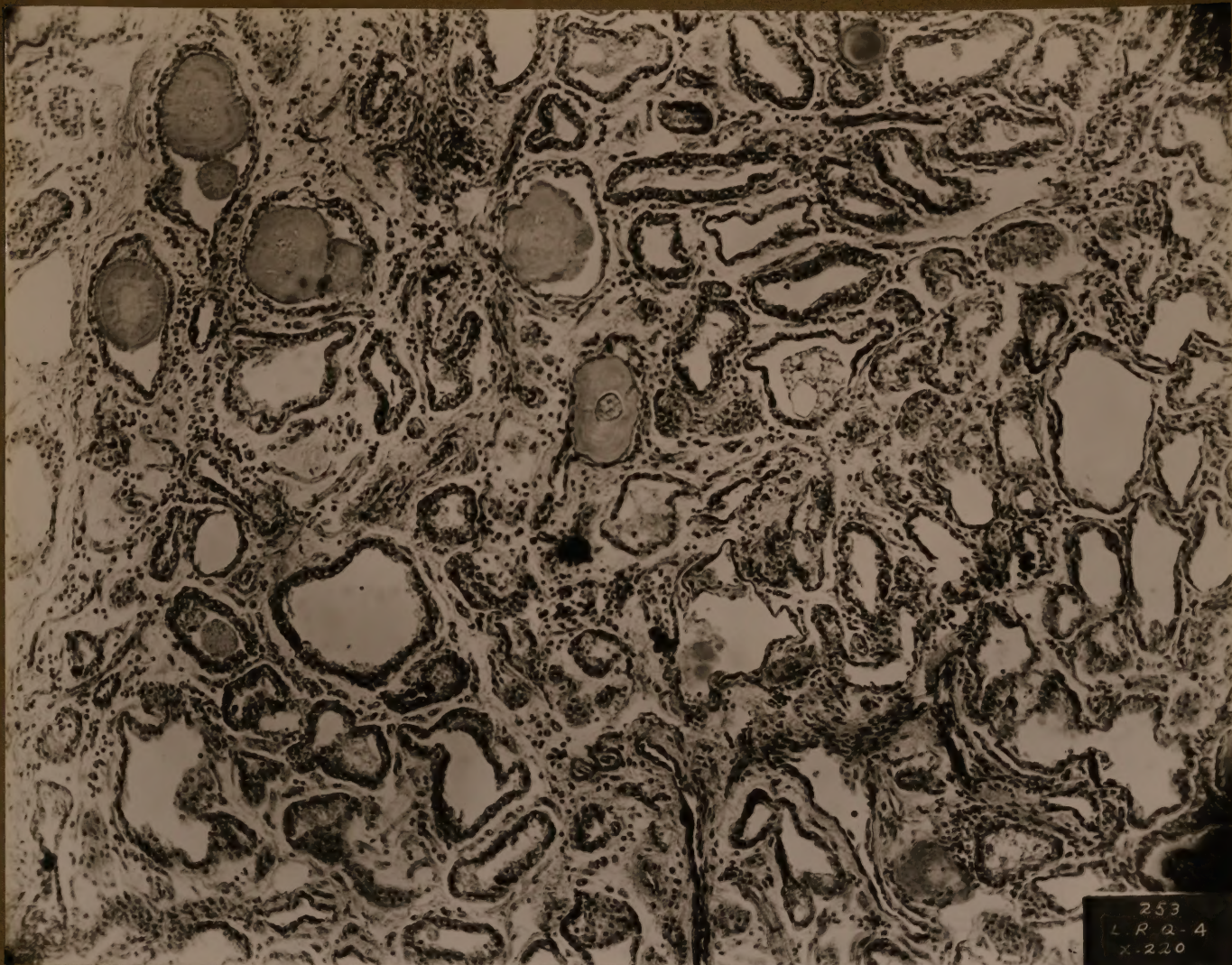
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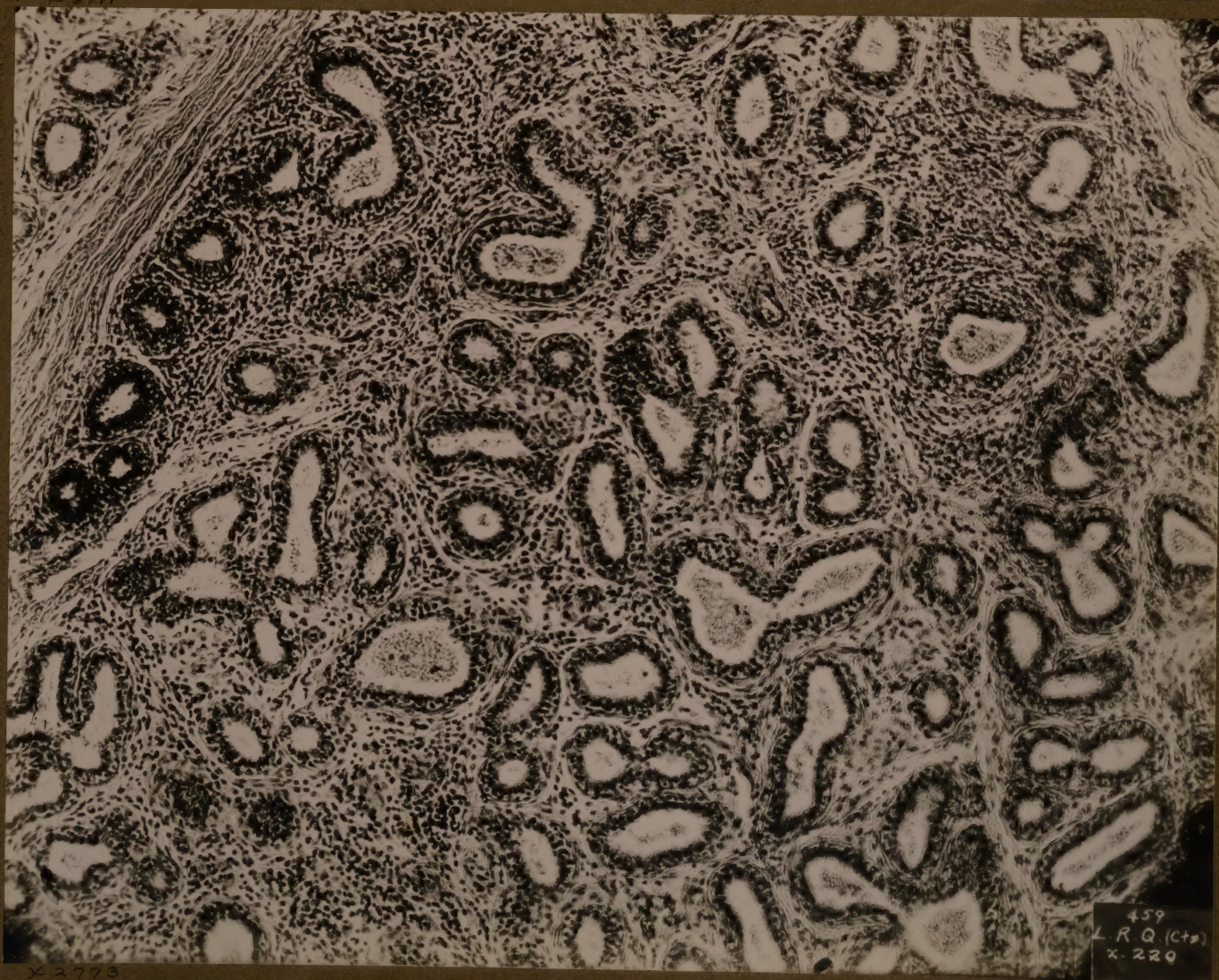
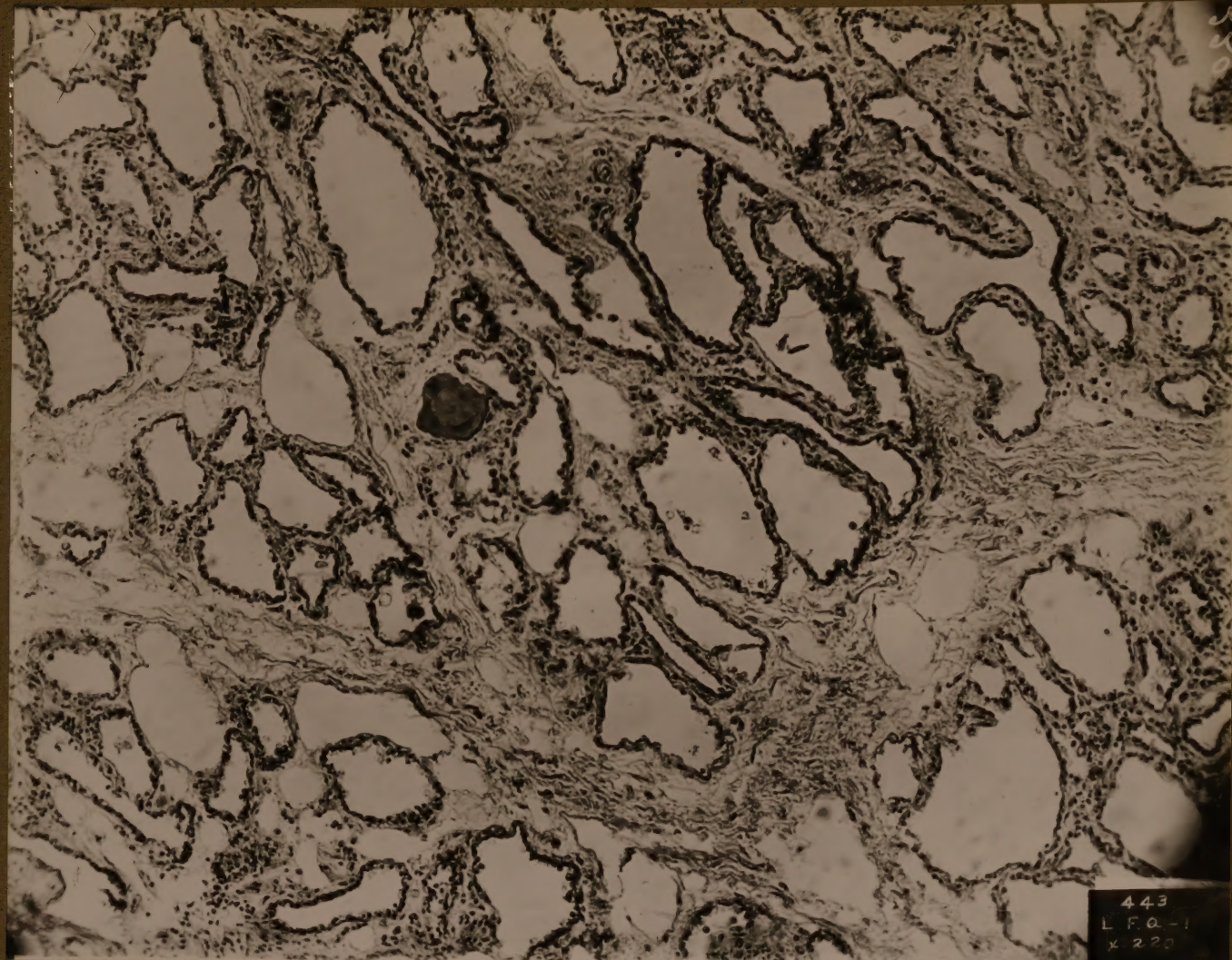
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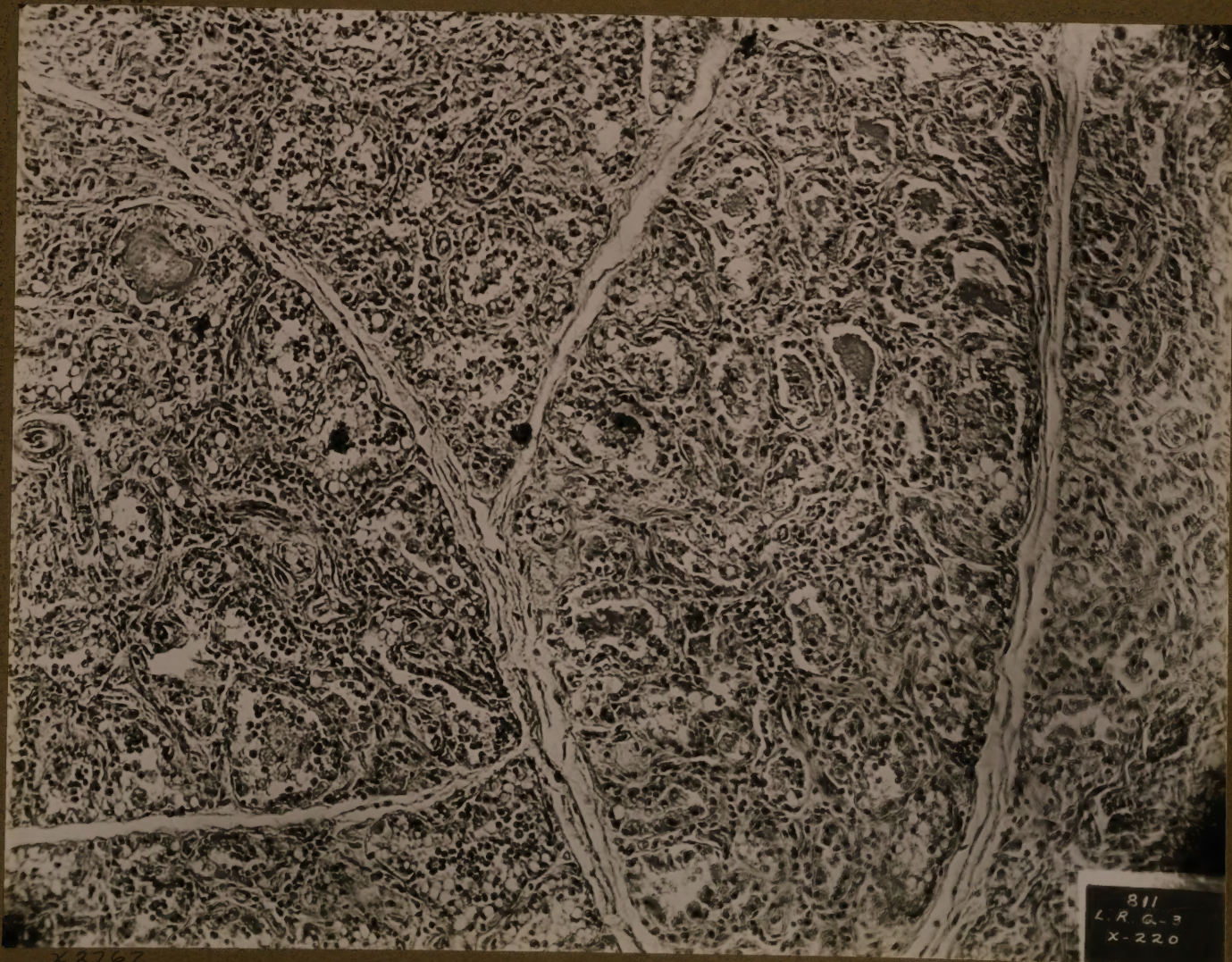
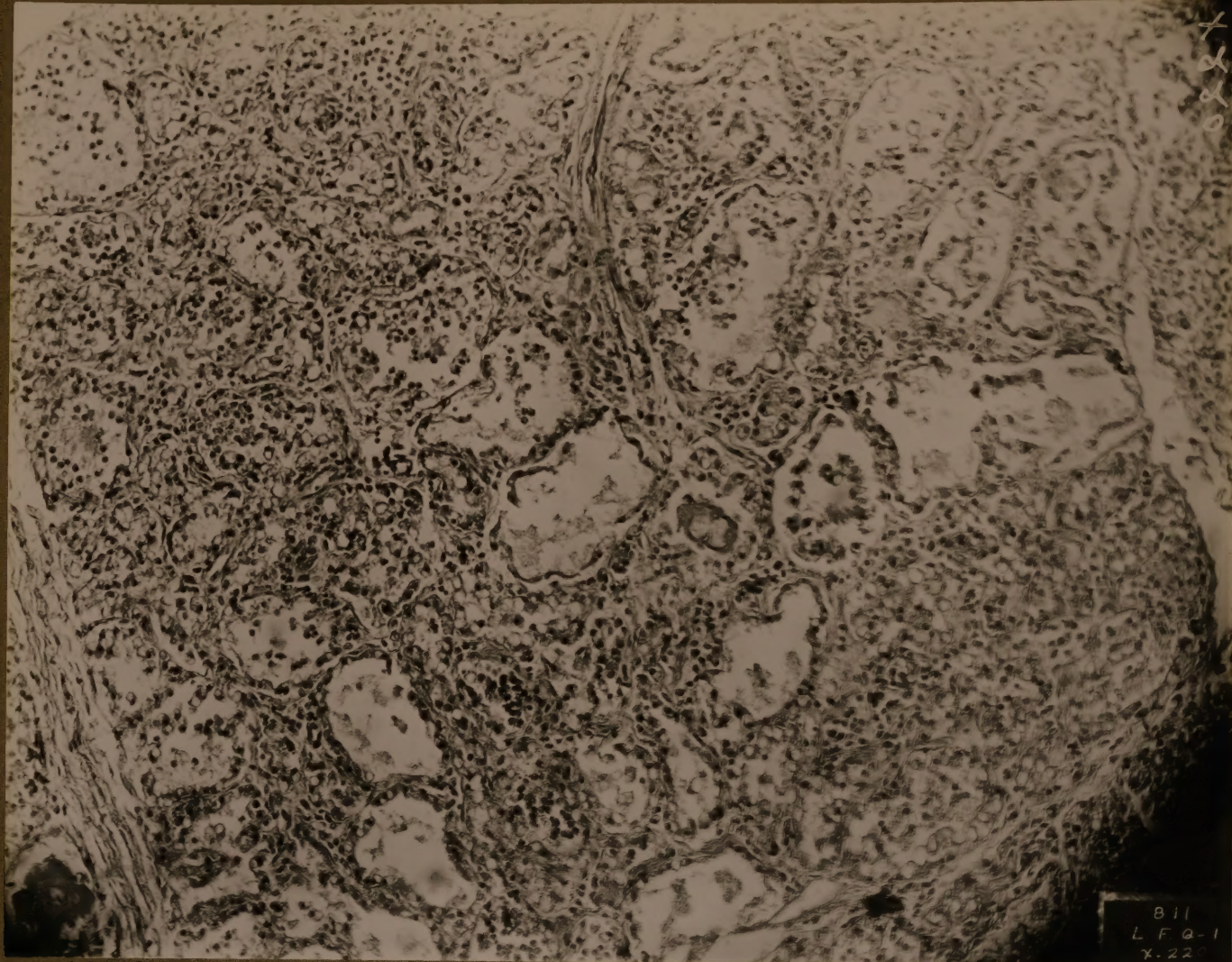


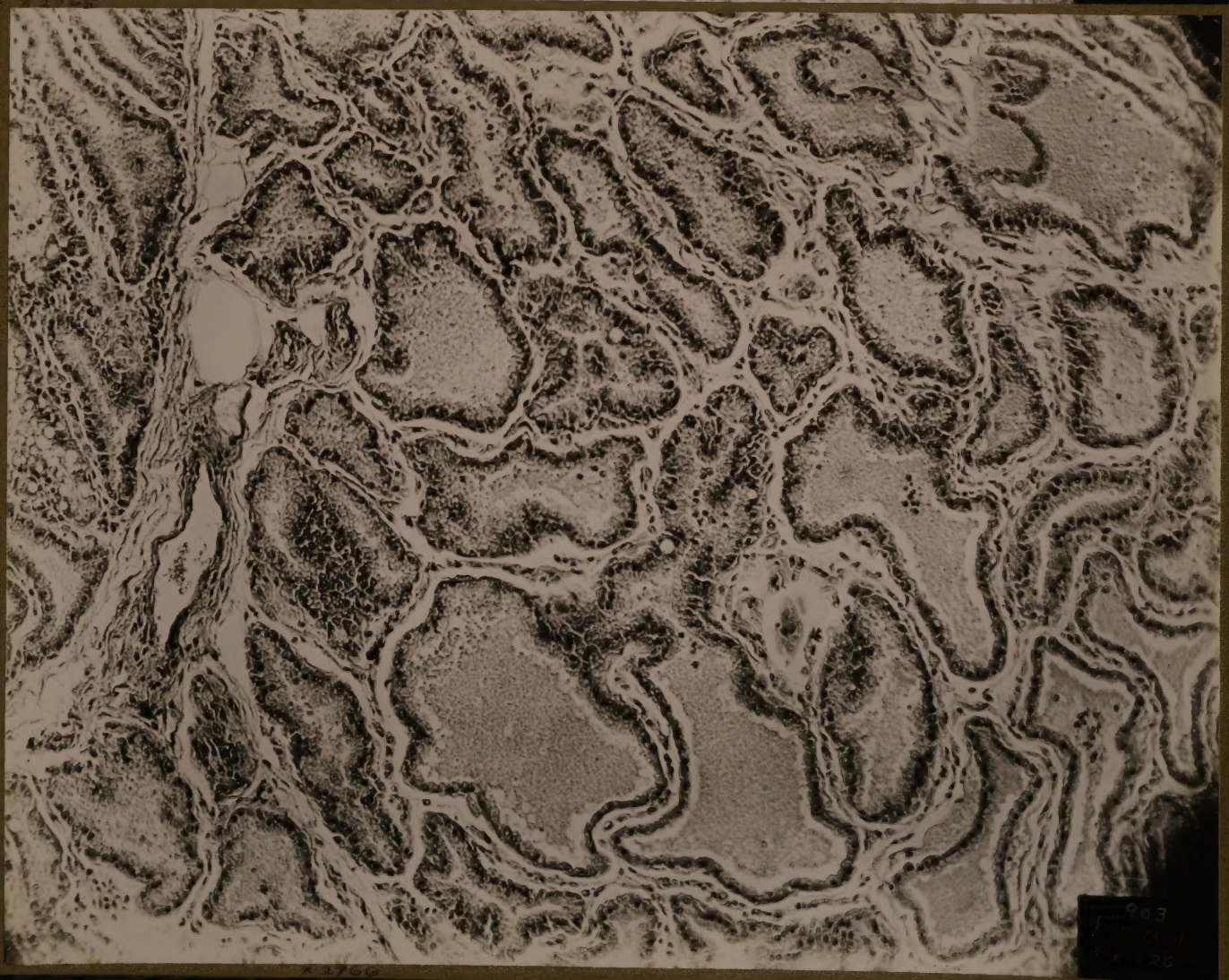
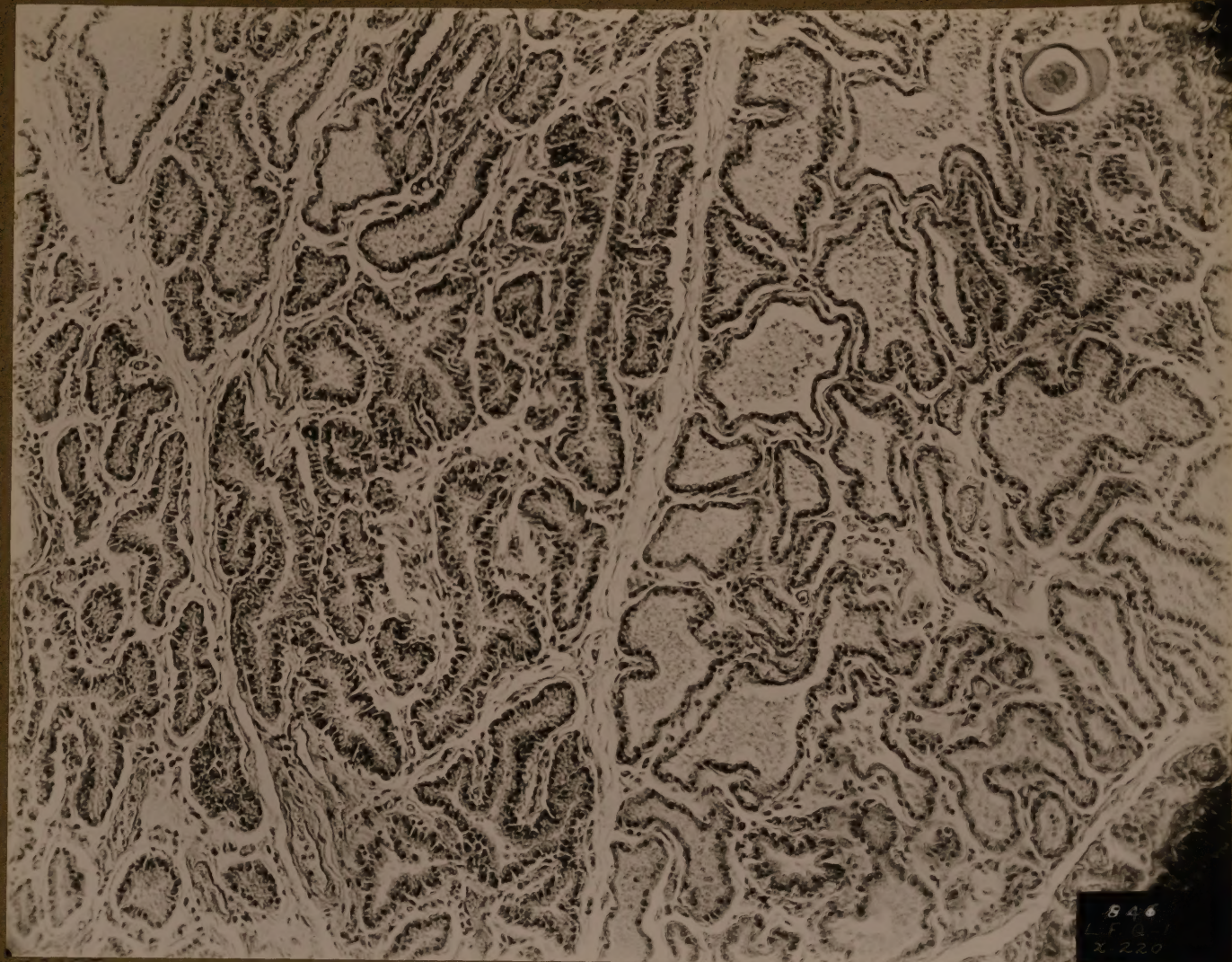
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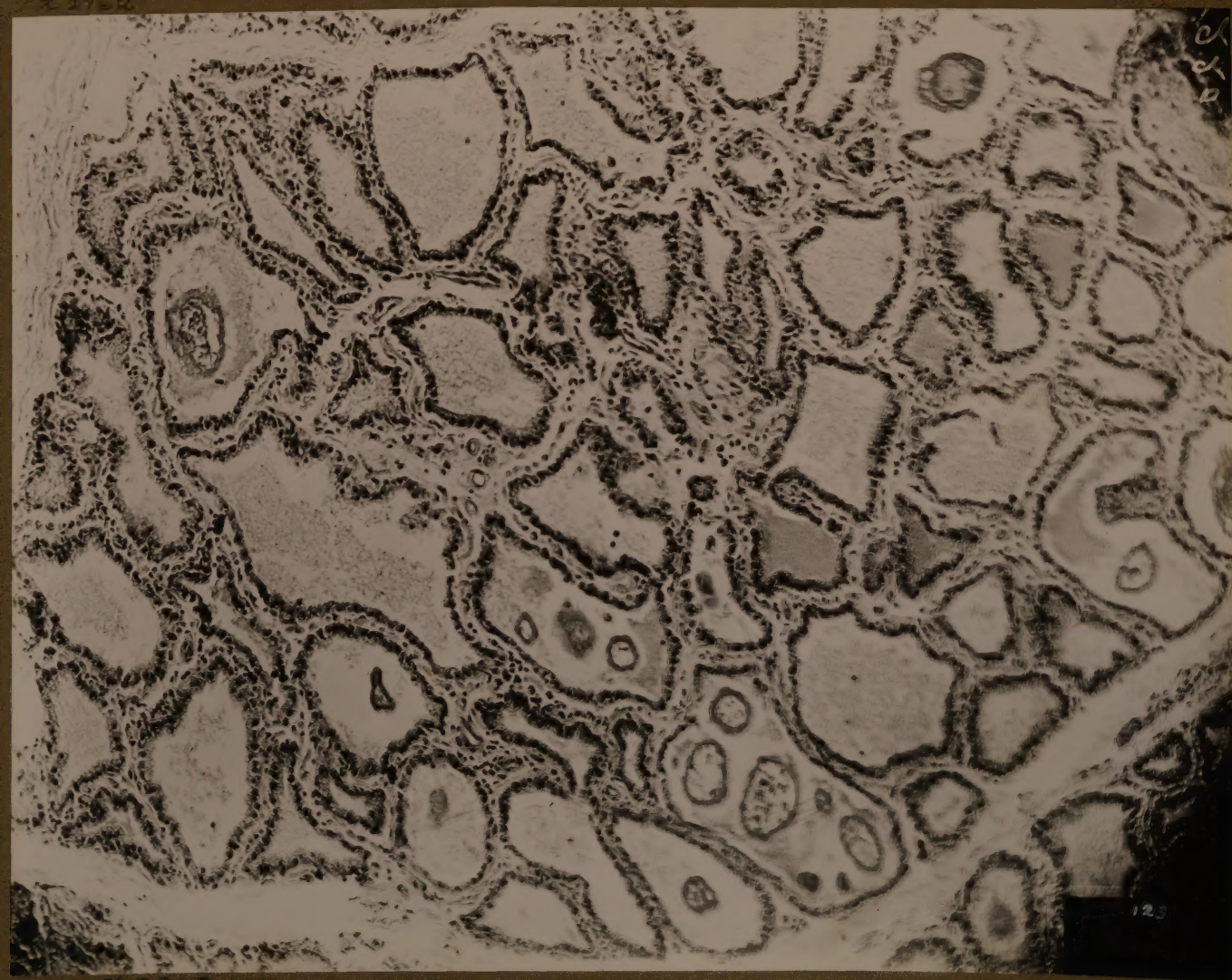
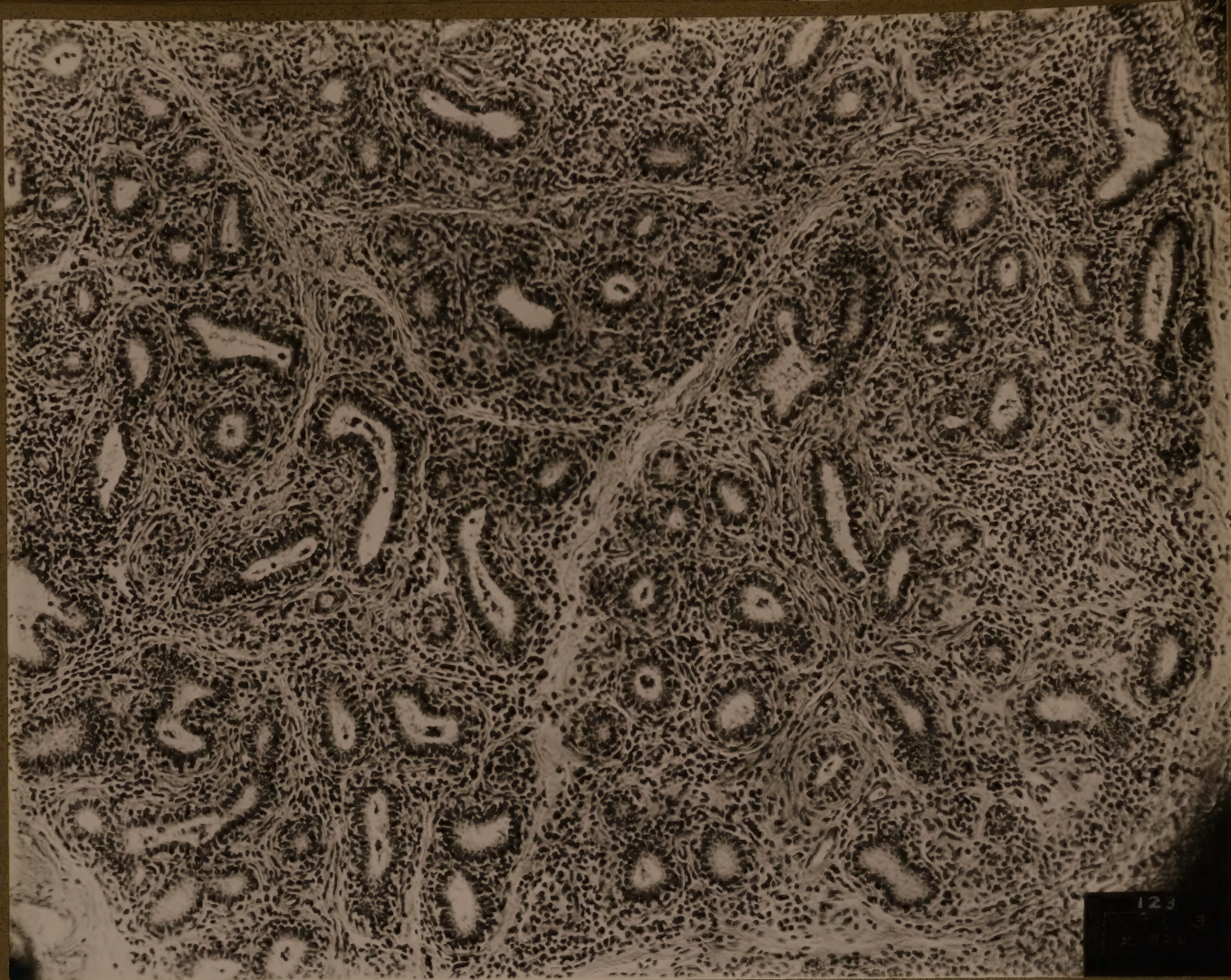
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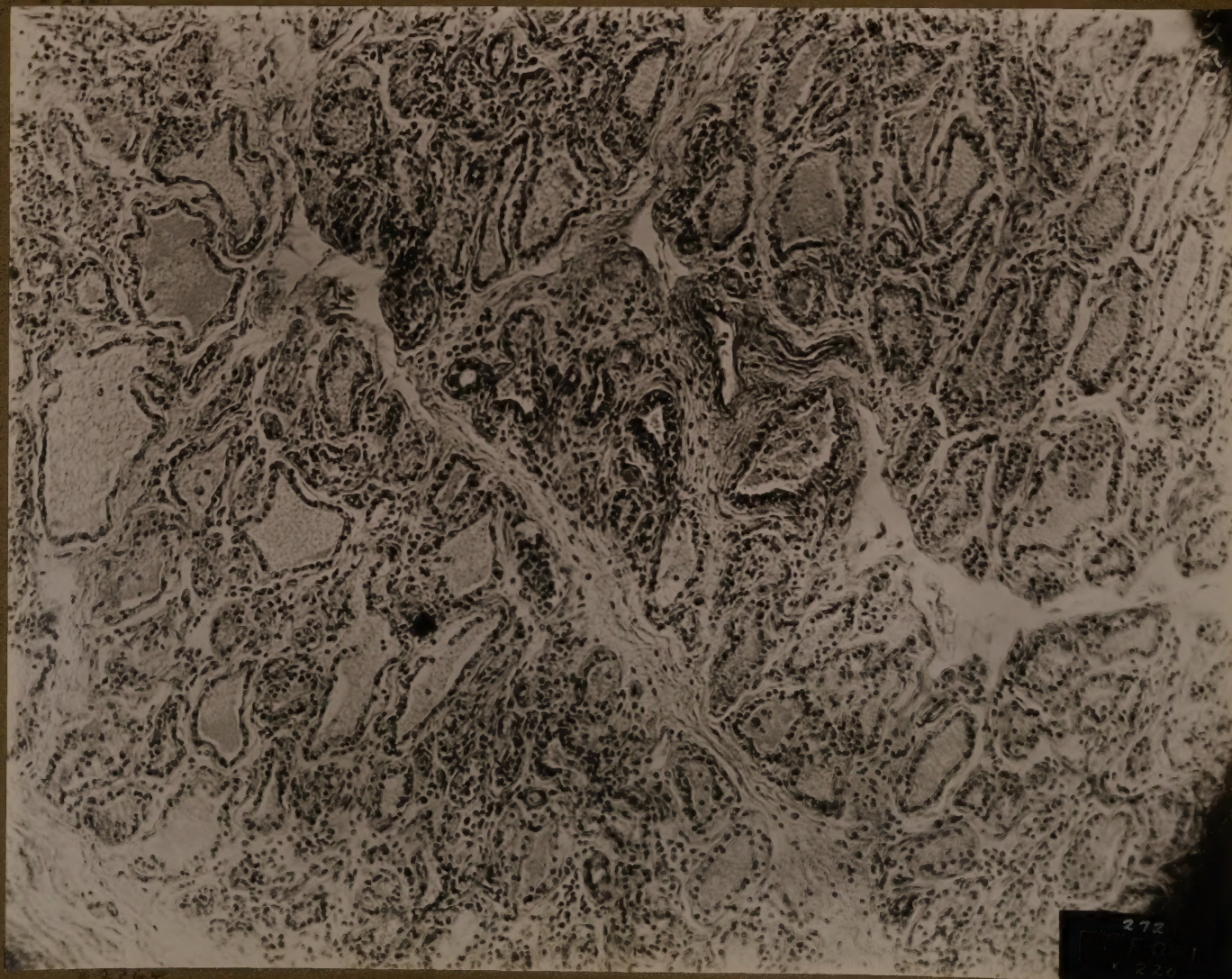
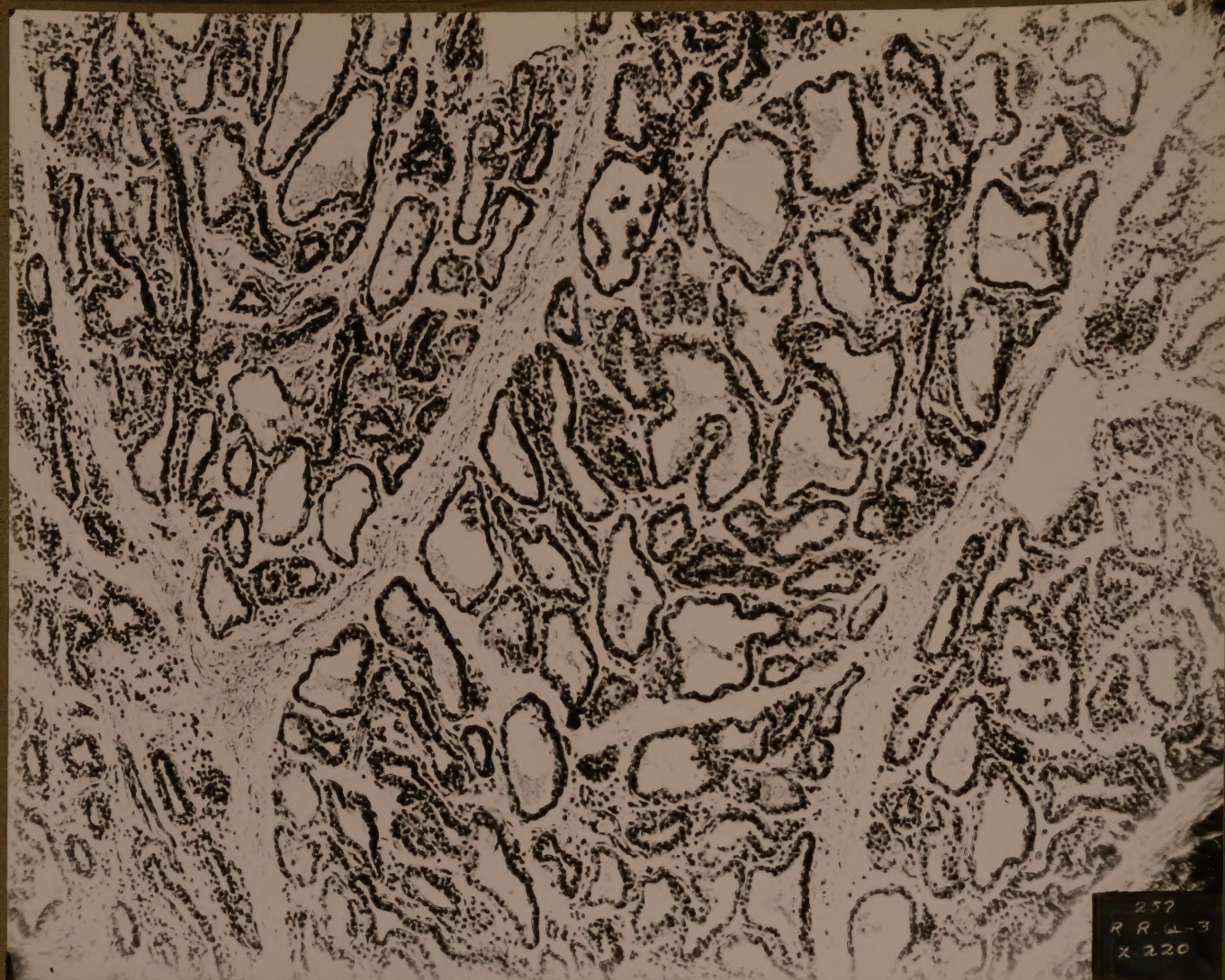


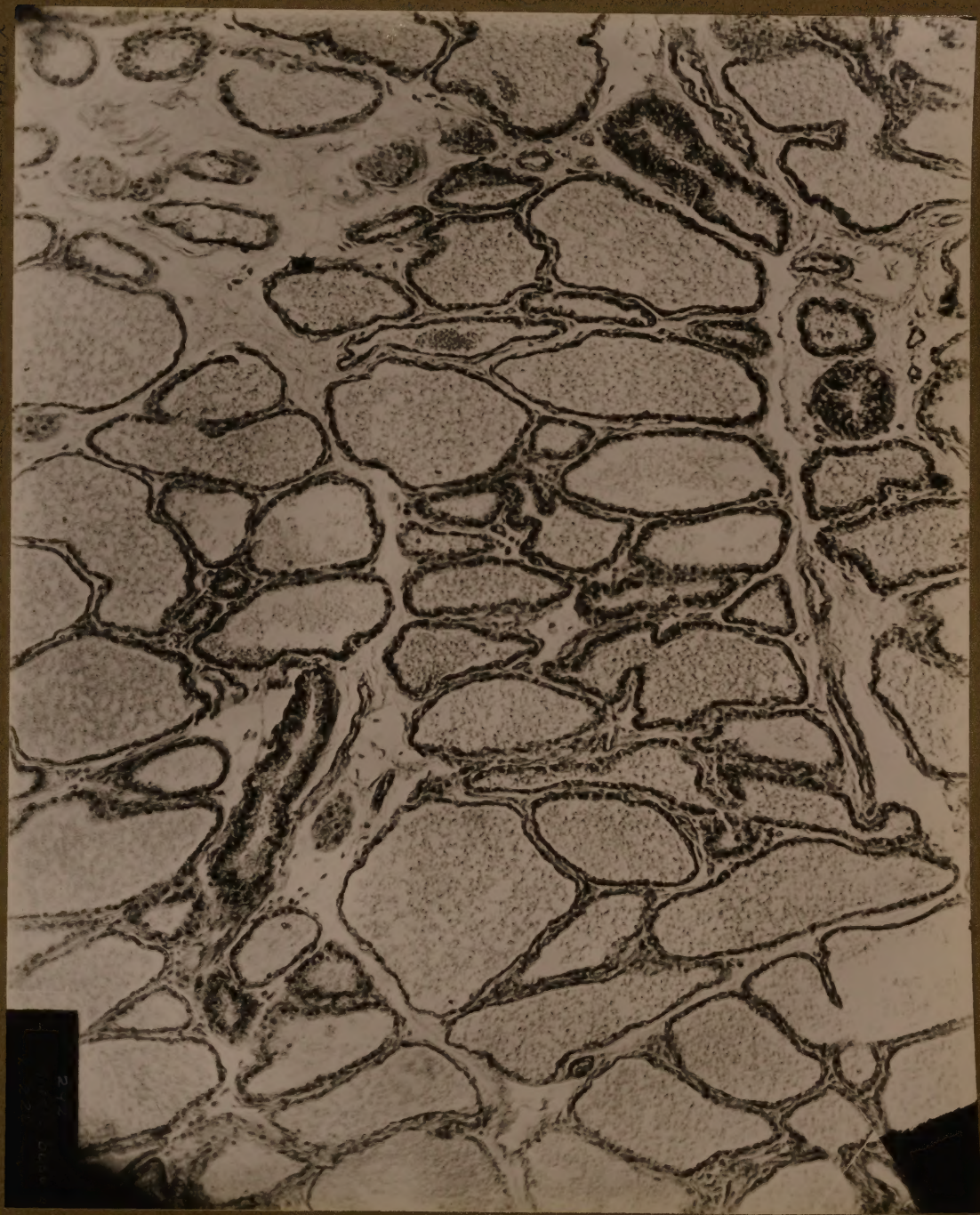






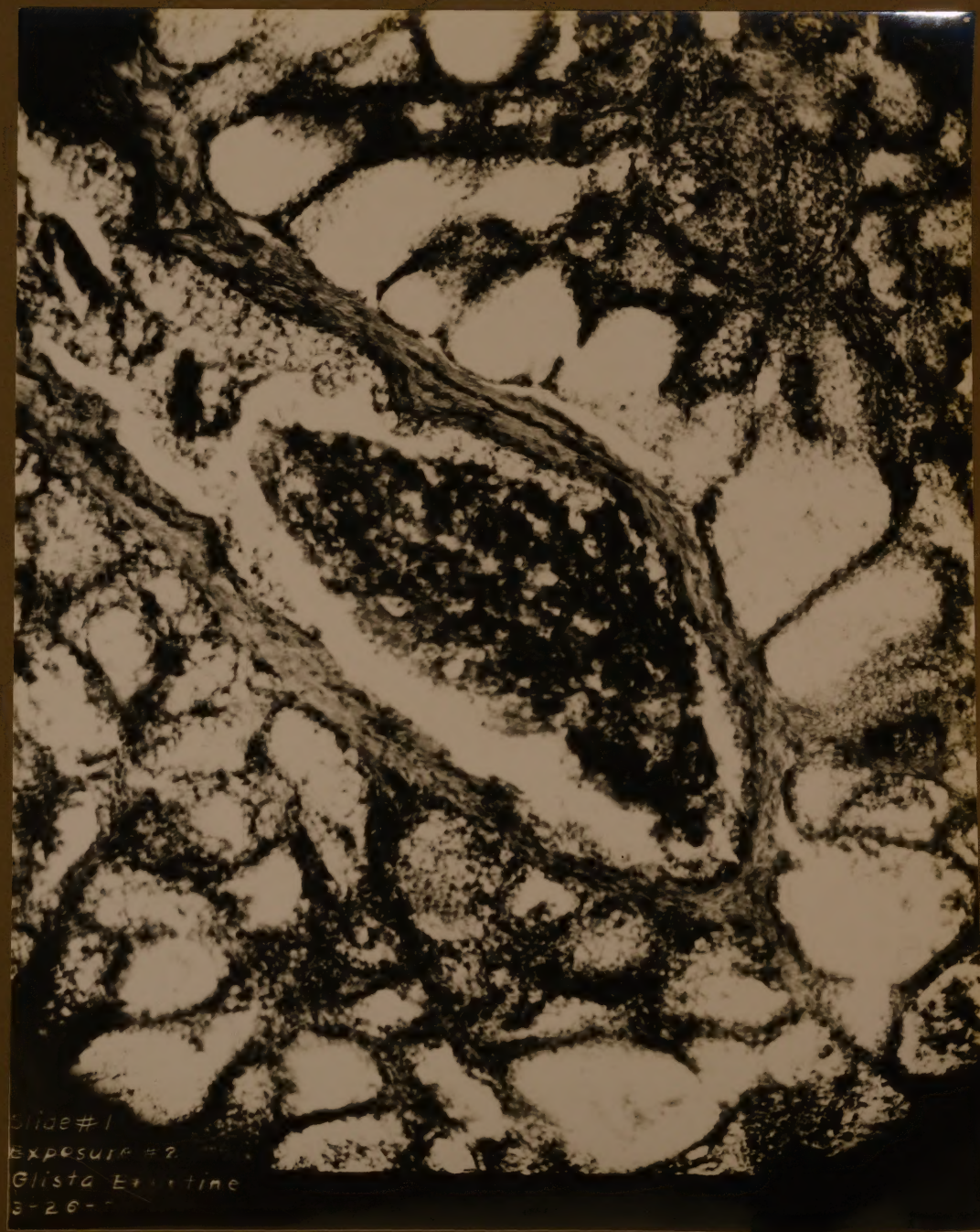
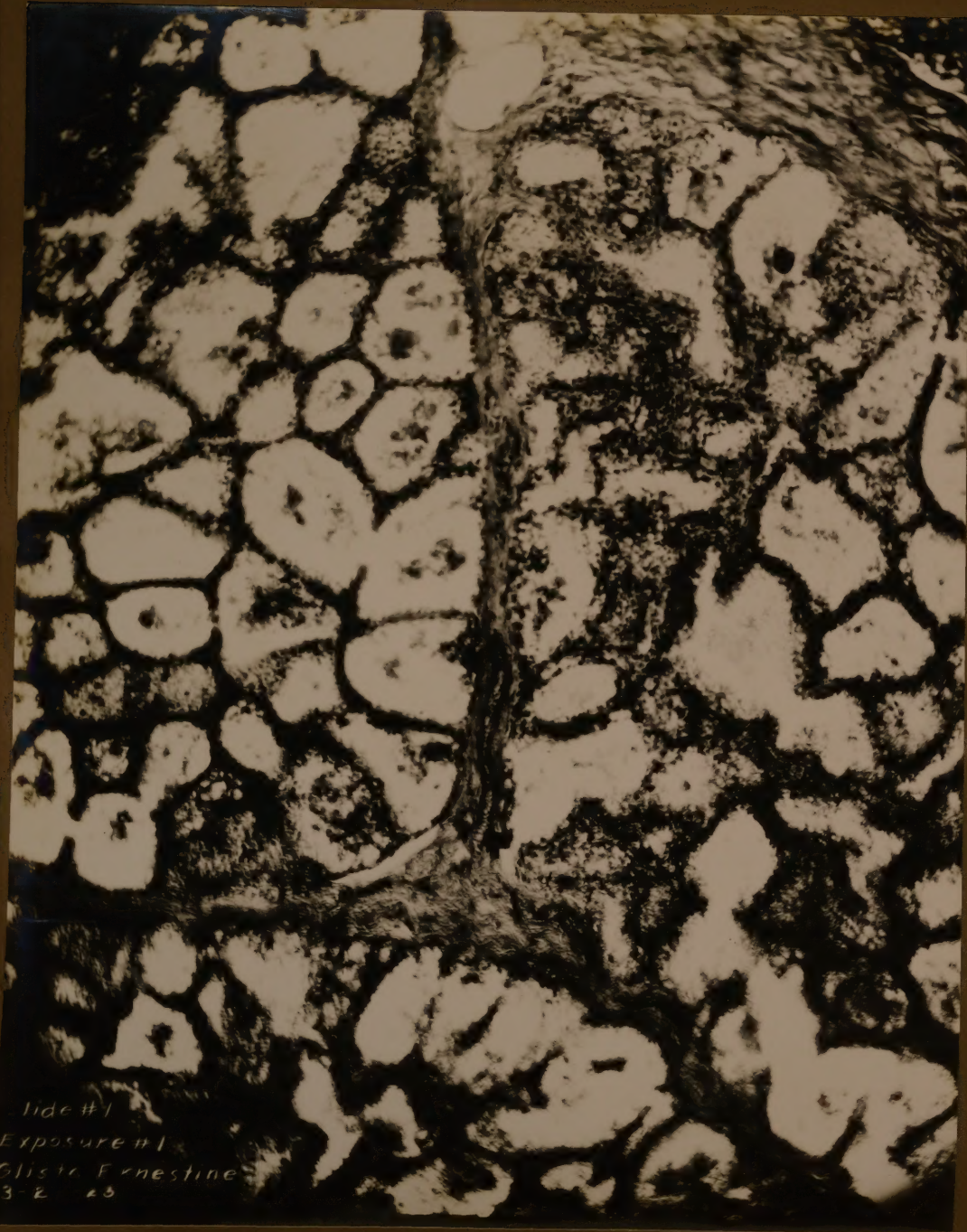


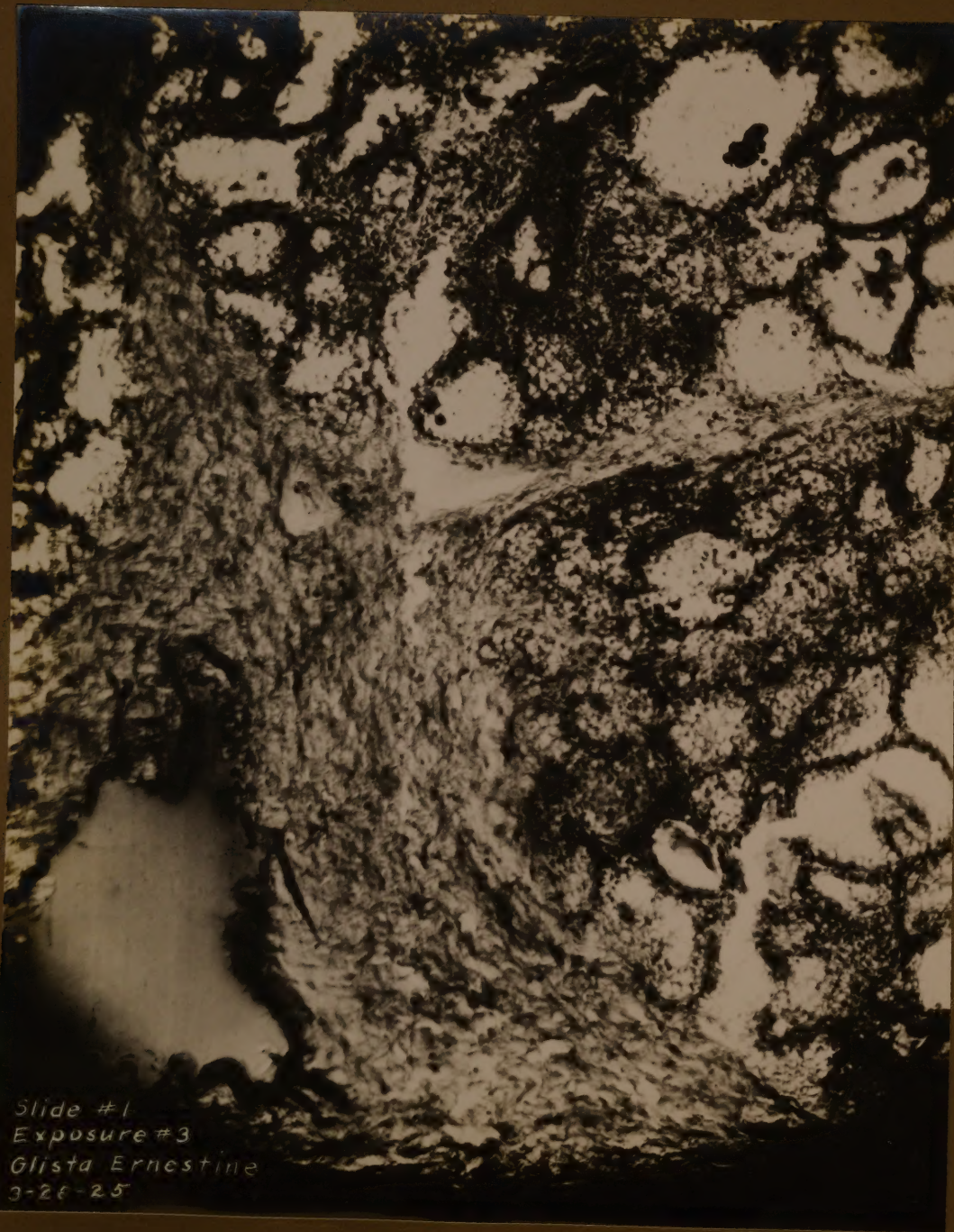




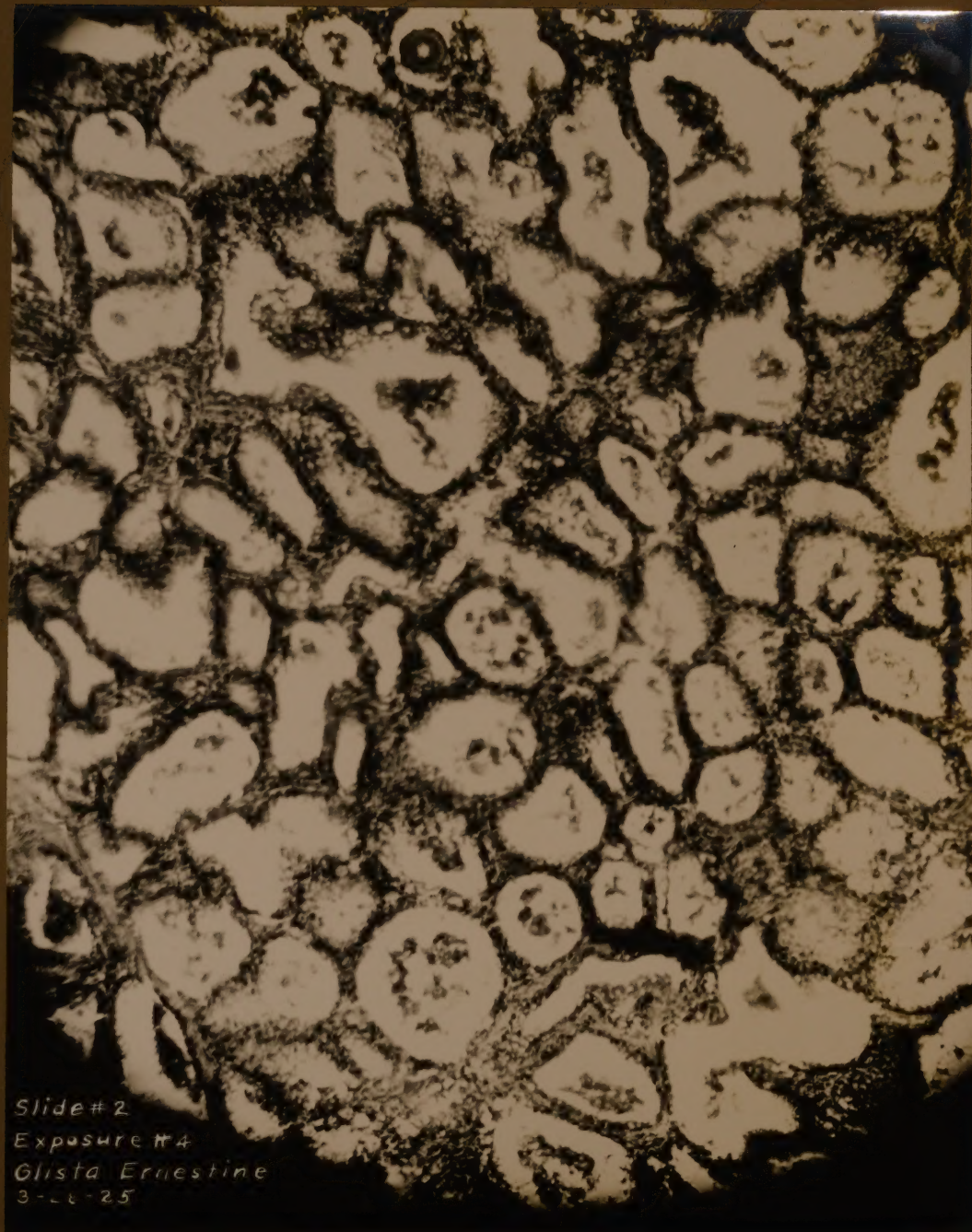
1944

PLACENTA
FETAL MEMBRANE
CHORIONIC MEMBRANE

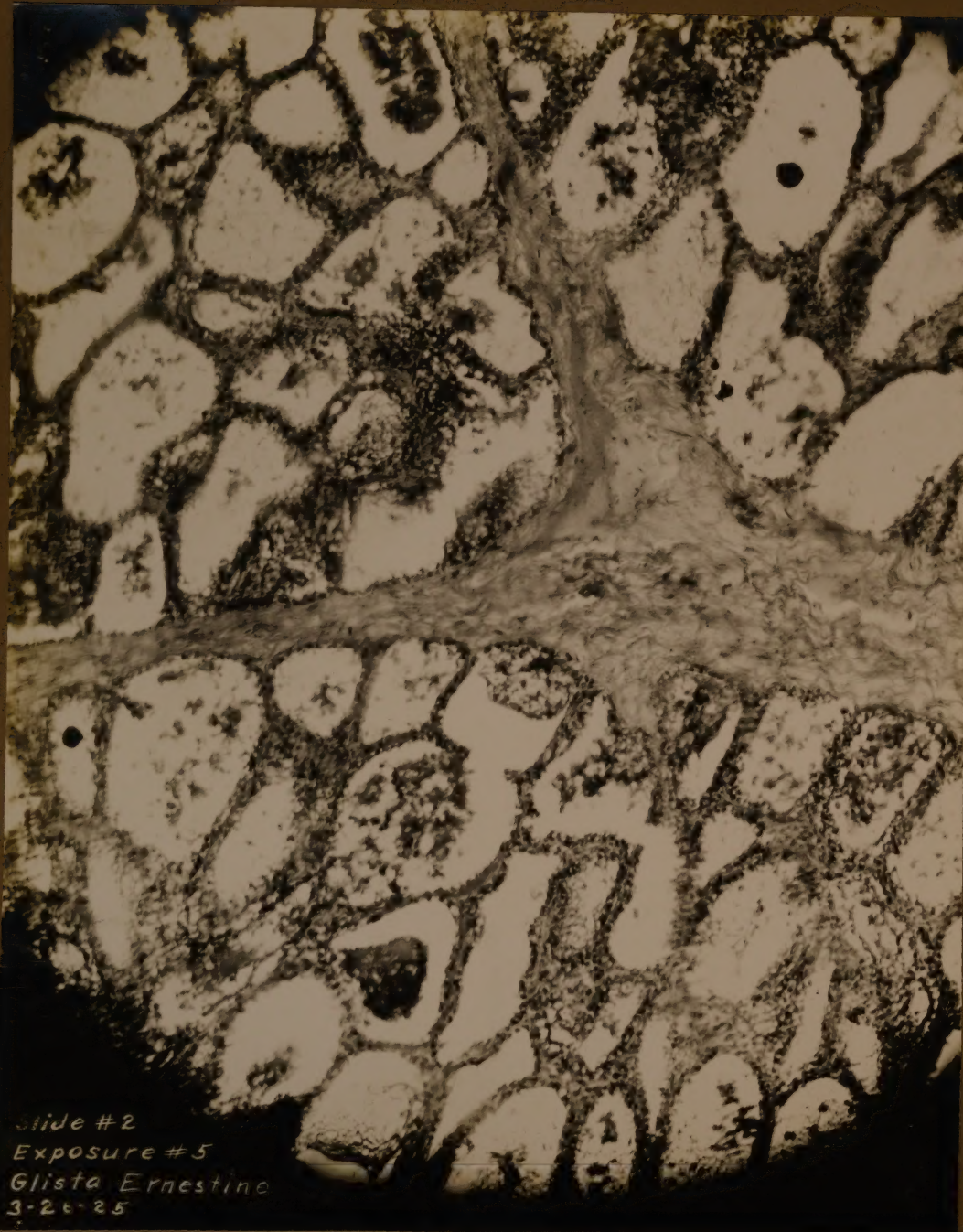


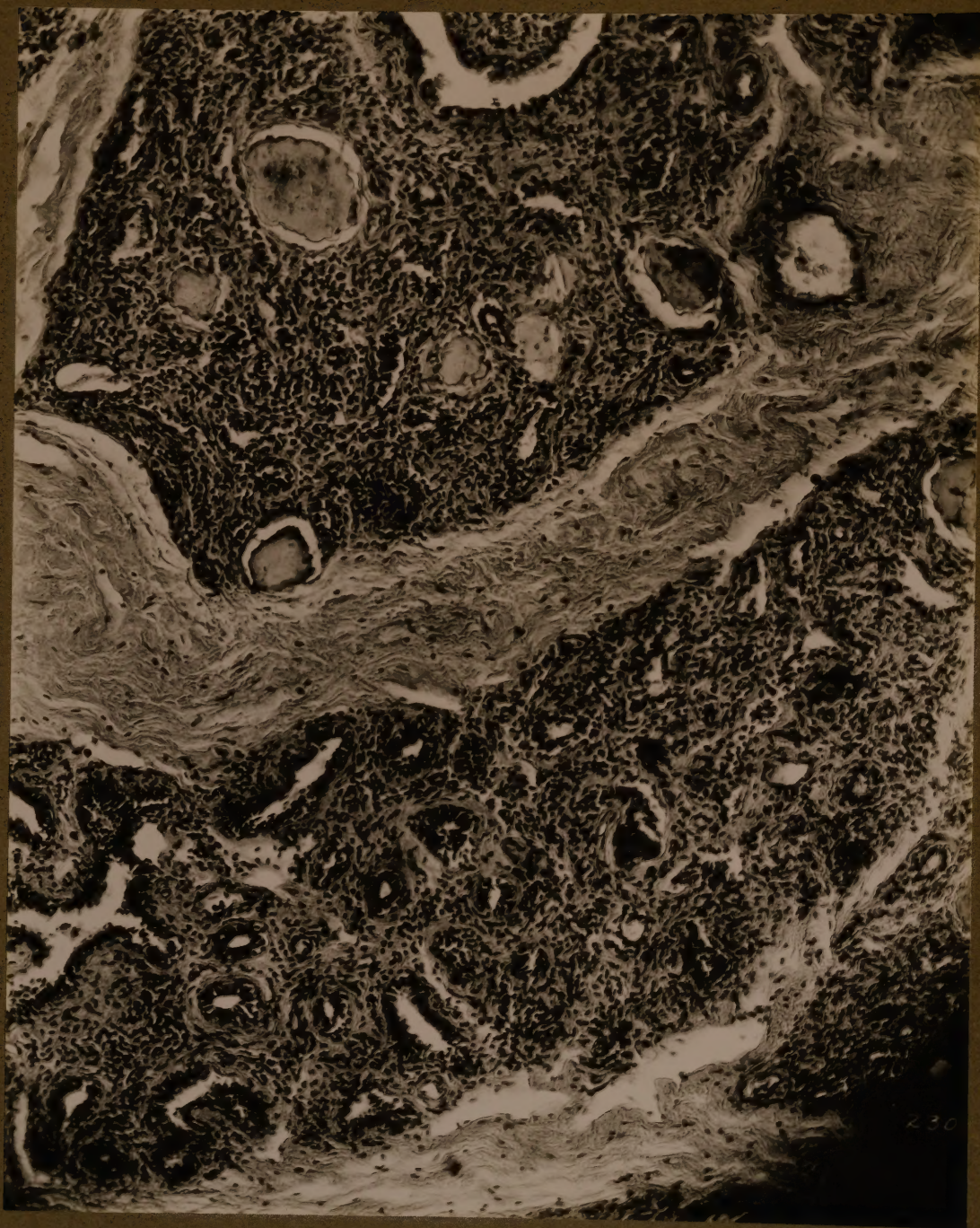


Slide #1
Exposure #3
Glista Ernestine
3-26-25

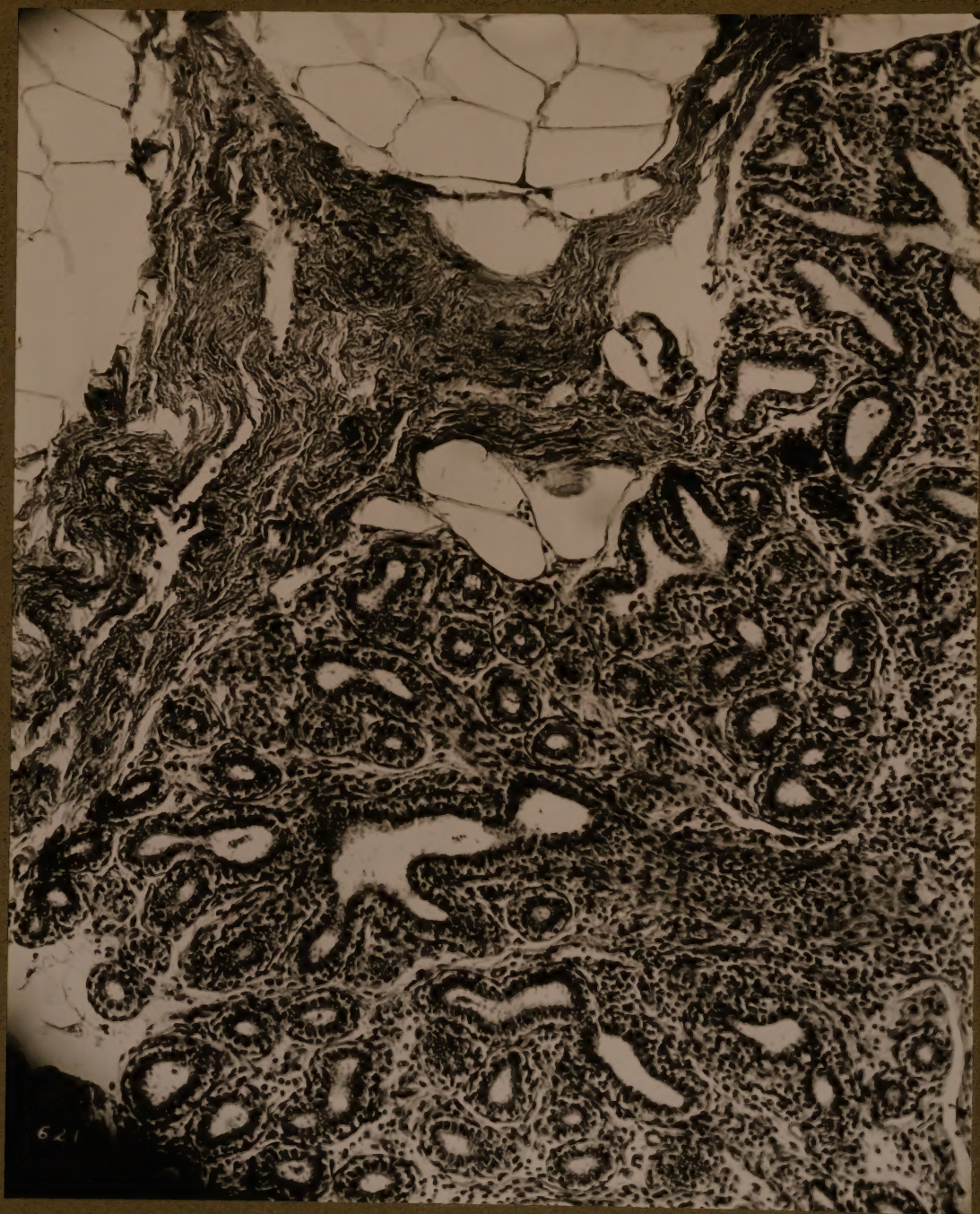


Slide #2
Exposure #4
Glista Ernestine
3-26-25

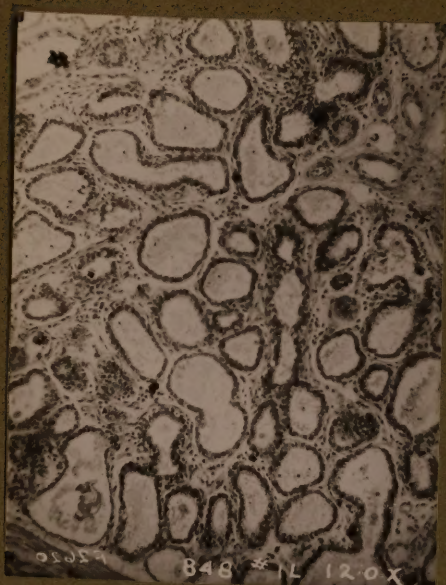




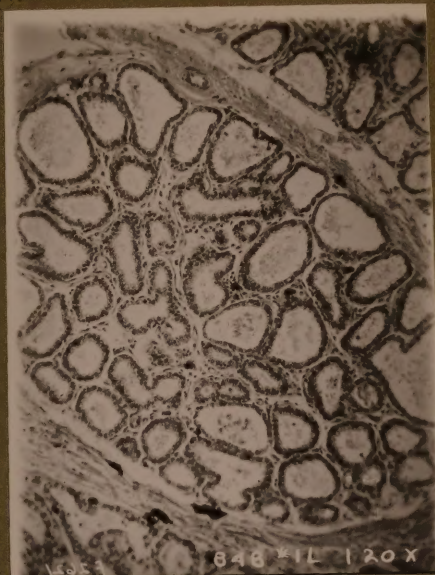




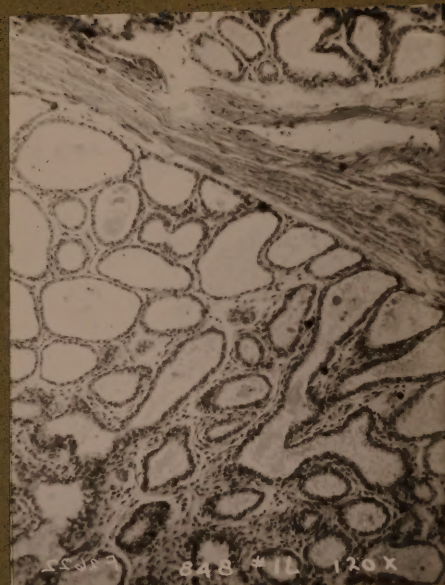




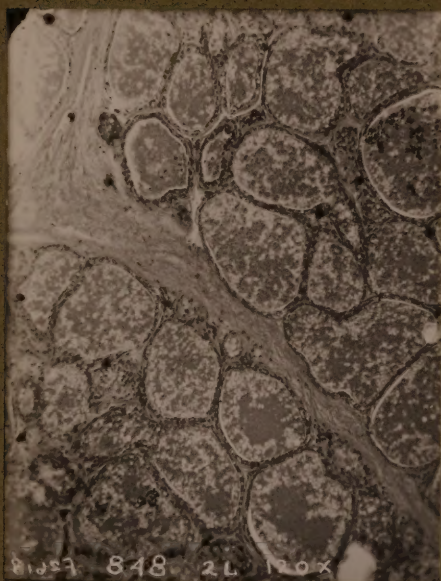
848 #1L 120X
72620



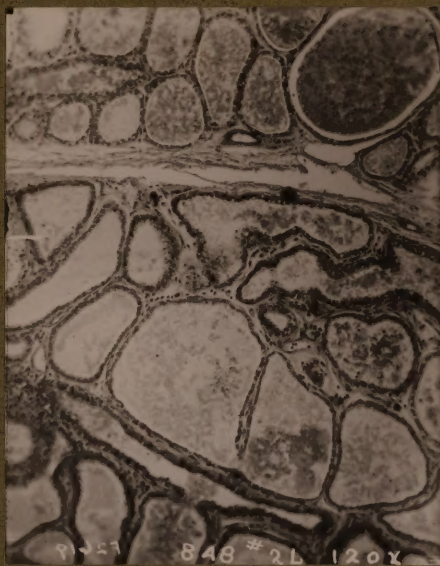
848 #1L 120X
72621



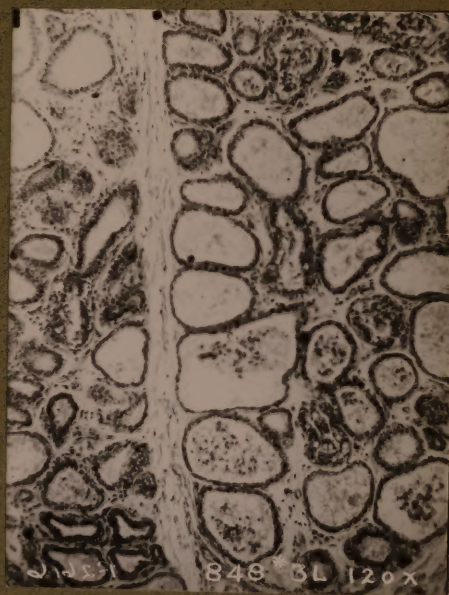
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72622



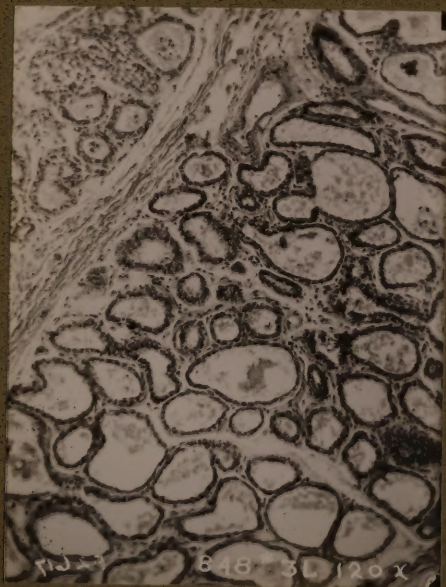
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72618



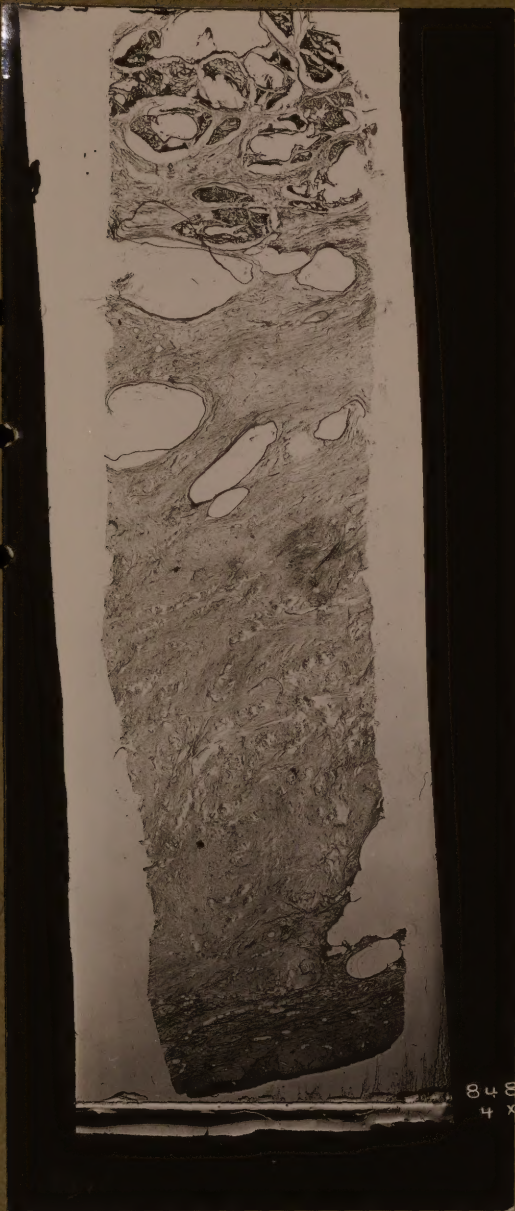
848 #2L 120X
72619



848 #3L 120X
72616

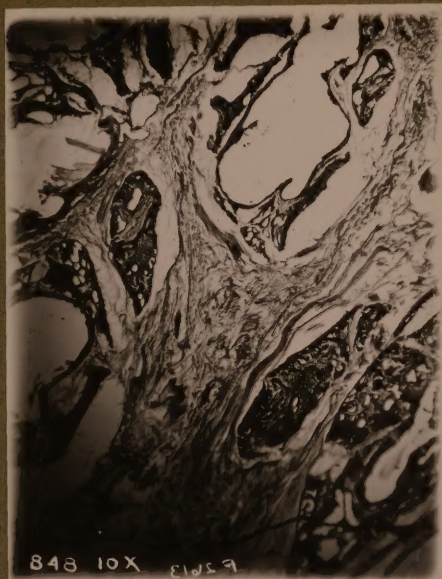


848 #3L 120X
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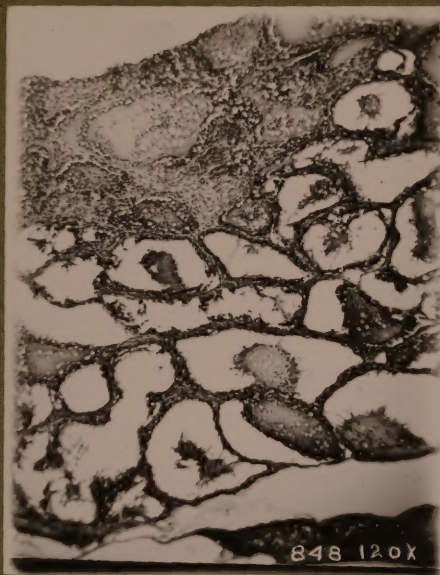
X 5575

848
4 X



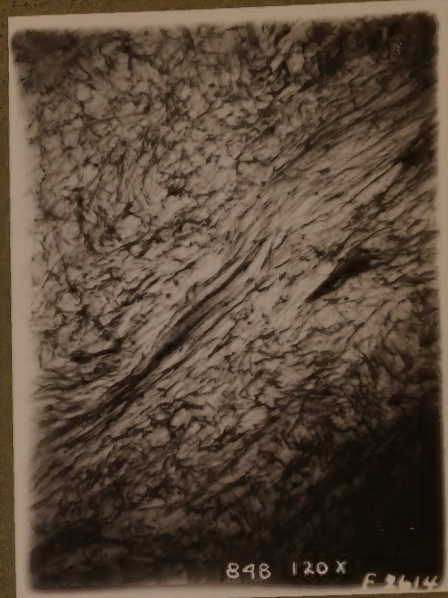
848 10X F2613

F2613



848 120X

F2615



848 120X

F2614

F2614

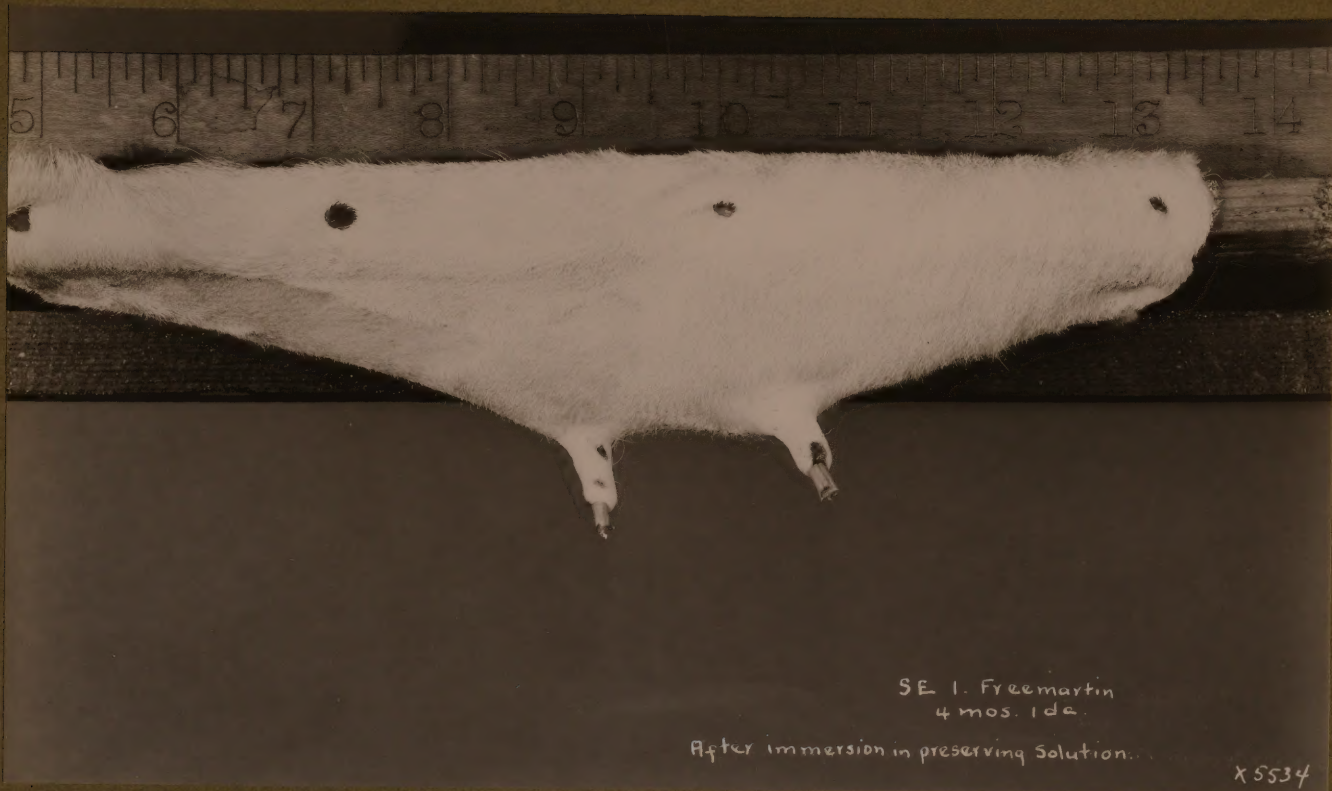


✓ 3082



✓ 3081







17867



17921



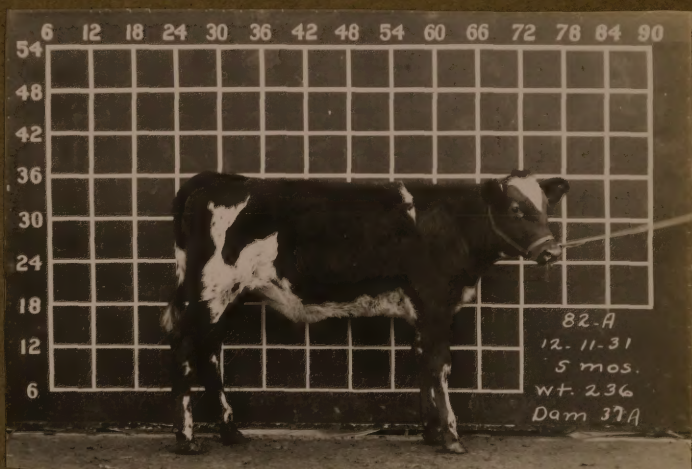
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18316



18236



18542



18996



19311



19777



20031



20032



20033



20034



16337



16319



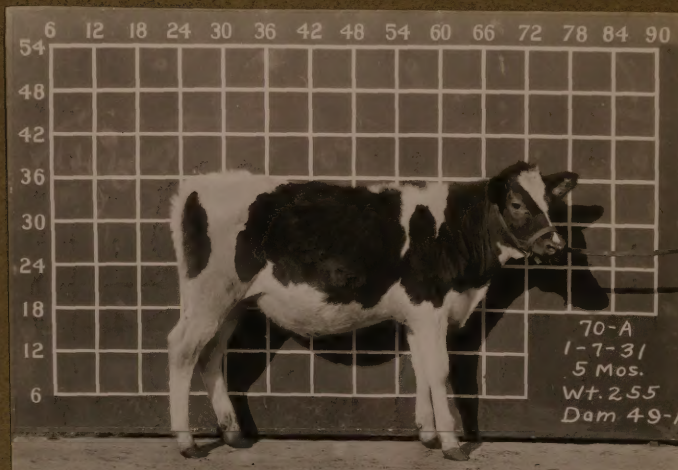
16277



16655



16757



17344



16970



17630



17975



19168



Freemartin
70-A
2.5.32
18 mos.
Rear

19169



Internal Genitals
70-A Freemartin

19173



External Genitals
70-A Freemartin

19174



19173

Internal Genitalia in position
70-9 Freemartin



19171



Internal Genitals
70-9 Freemartin

19172



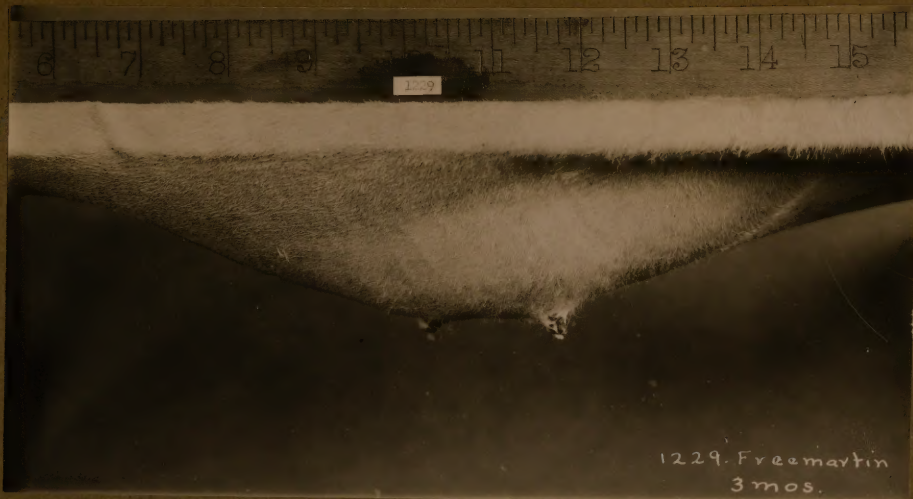
Internal Genitals
70-9 Freemartin

19170



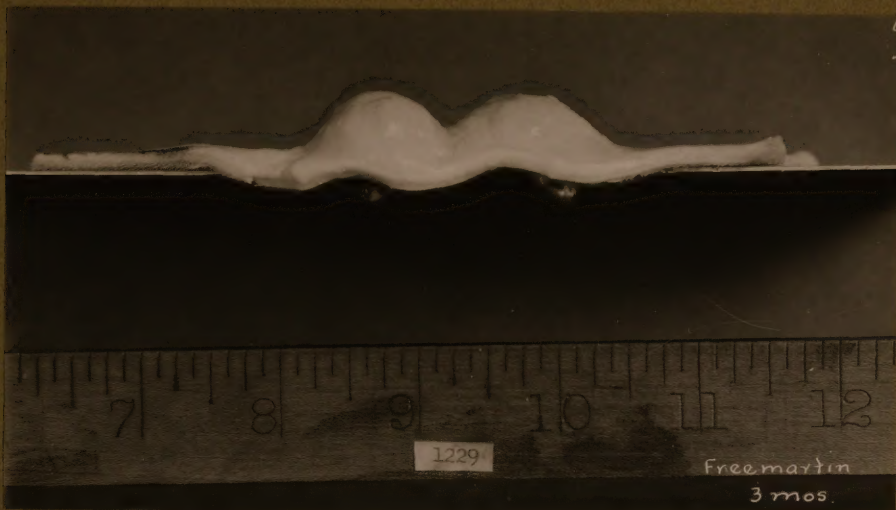
10145





22692

1229. Freemartin
3 mos.



22691

Freemartin
3 mos.



X 3882

1229. Freemartin
internal Genitals



1212 FM.
4-25-33
3 mos.

21327



1212

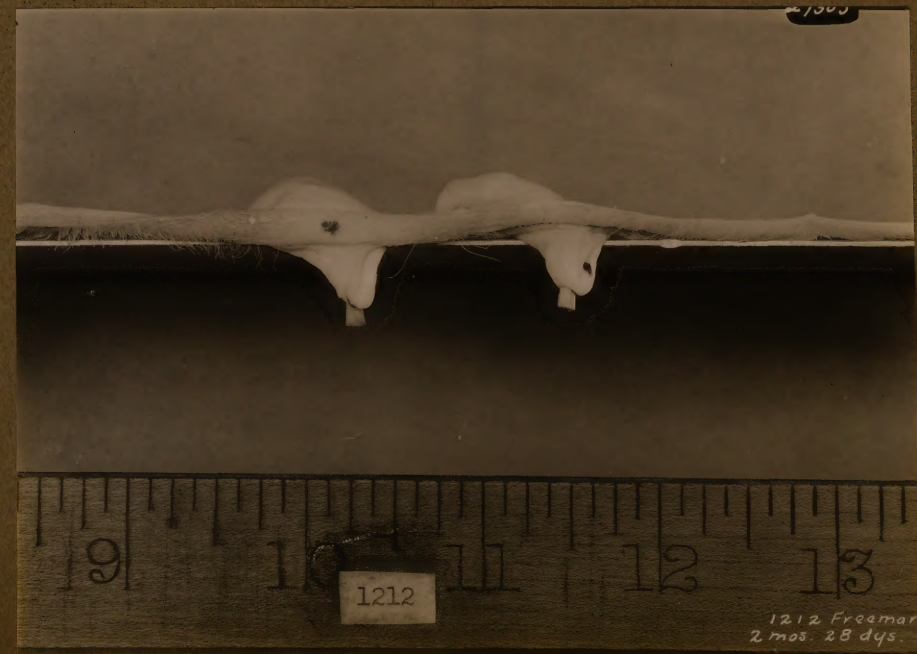
1212. Freemartin
2 mos. 28 dys

21302



1212 Freemartin
4-25-33
3 mos.
External Genitals

21326



1212

1212 Freemartin
2 mos. 28 dys.

21303



X3635



X3634



X3636

1212. Freemartin
2 mos. 28 dys

X3636



1209 FM
1-10-34
12 mos.

22709



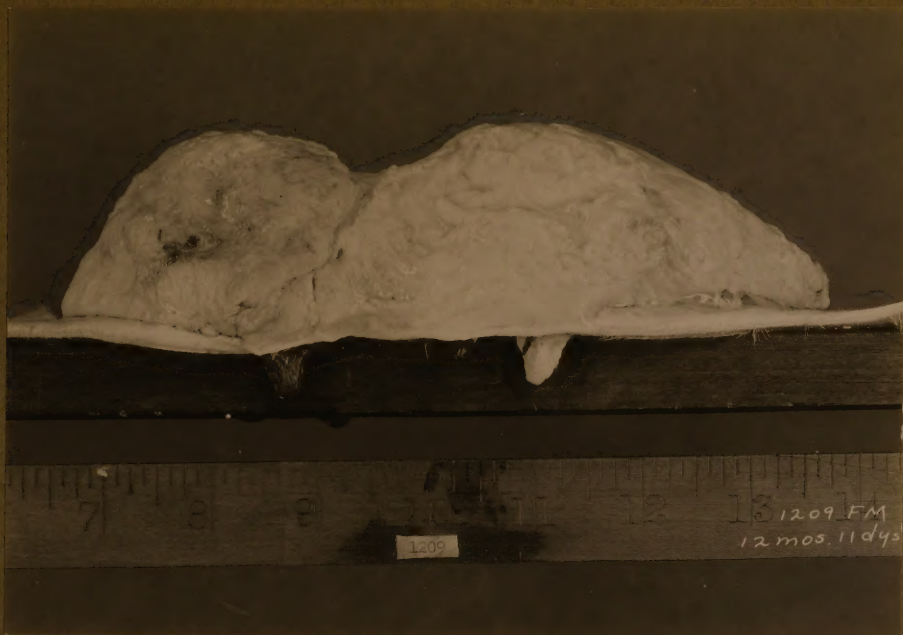
1209 FM.
12 mos. 11 dys.

22780



1209 FM.
12 mos. 11 dys.

22779



22777



22778



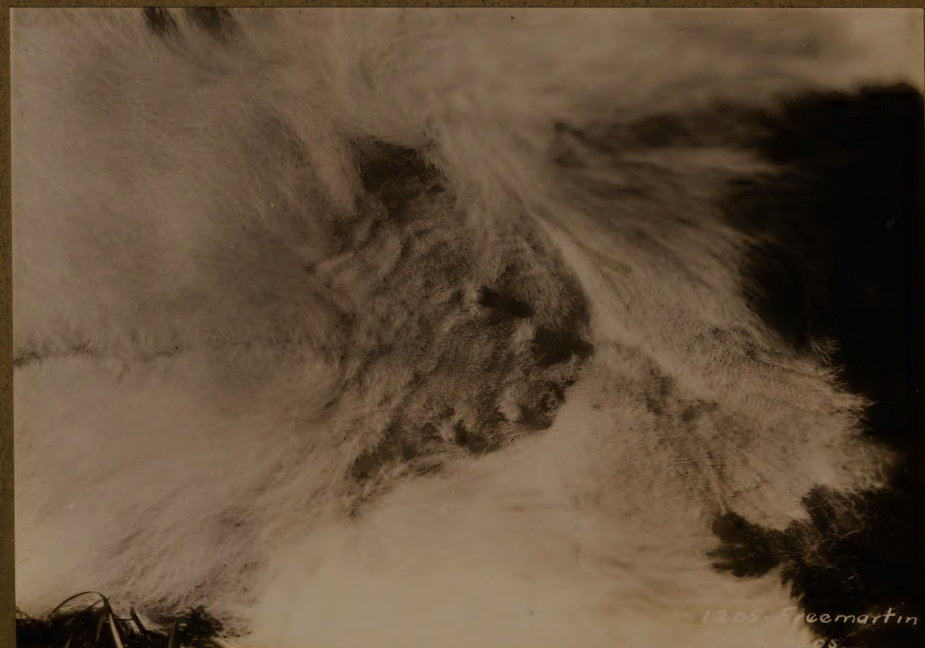
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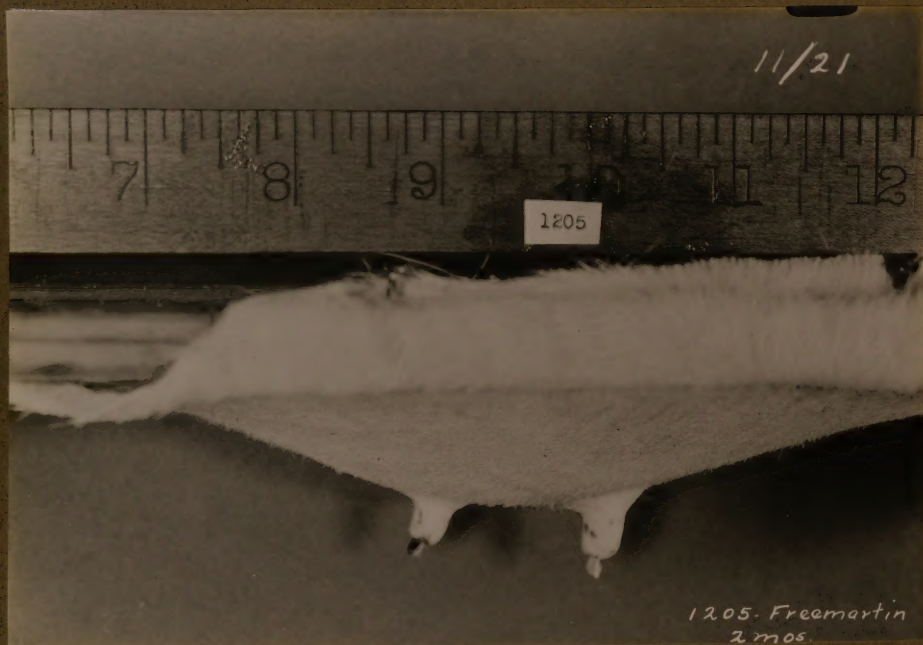
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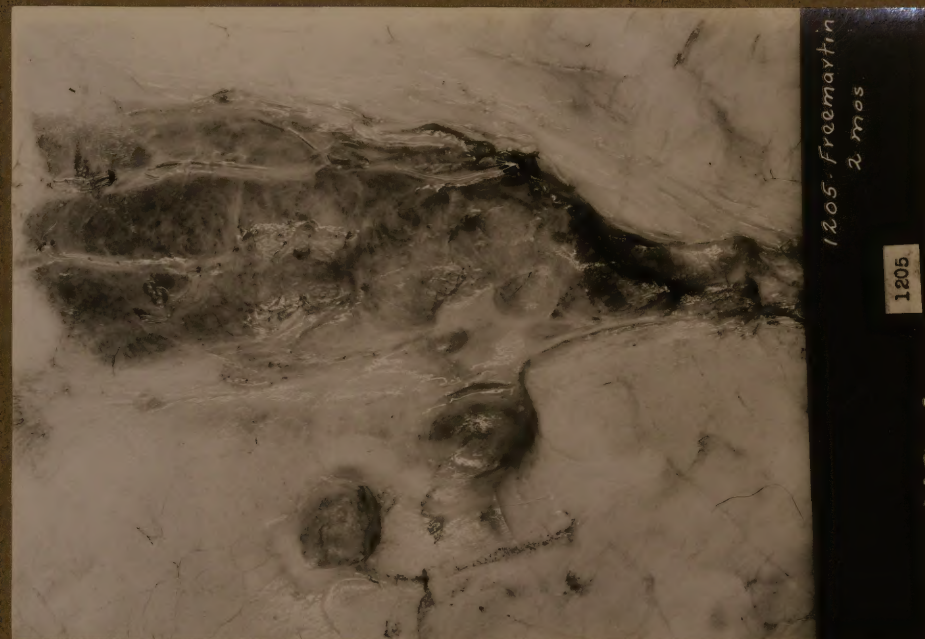
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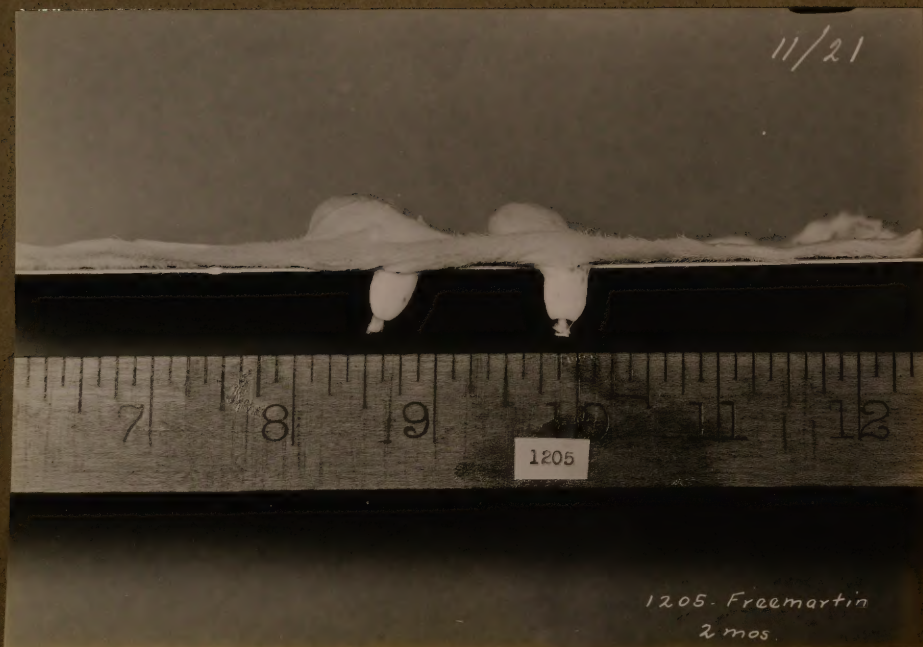
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20768



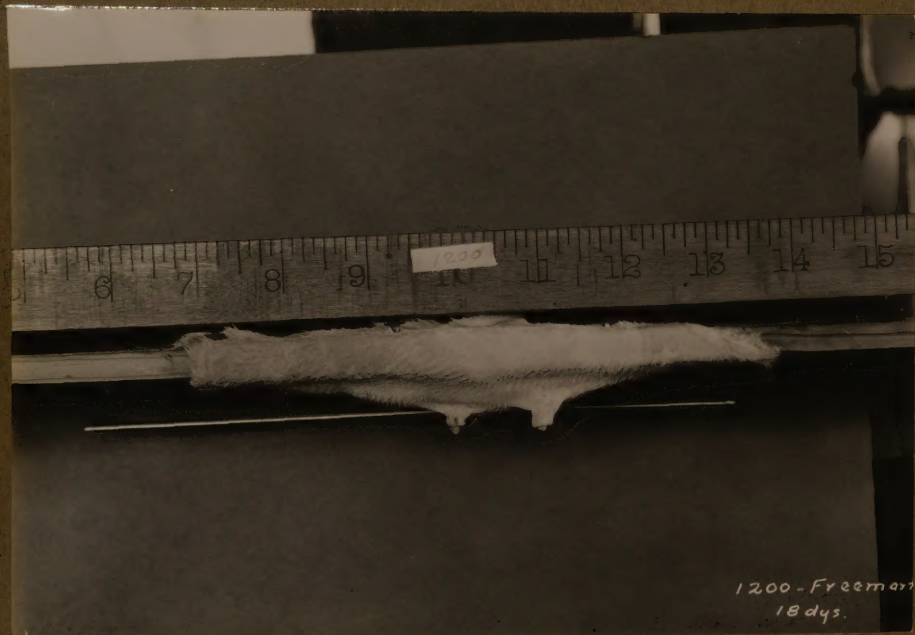
20561



20769



20560



1200-Freemartin
18 dys.

20571



Internal Genitals
1200. Freemartin

20570



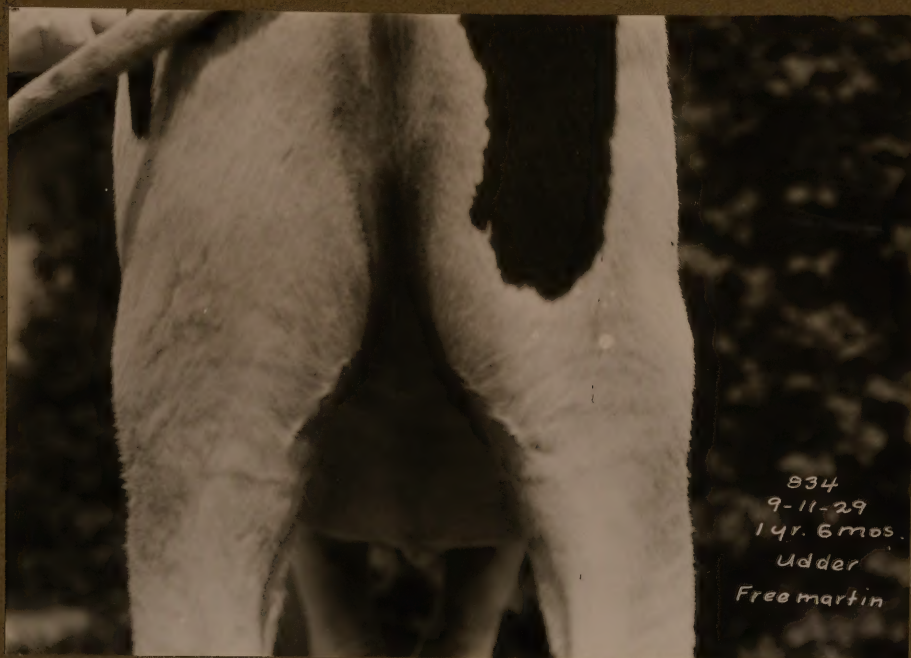
1200 Freemartin
18 dys.

20572



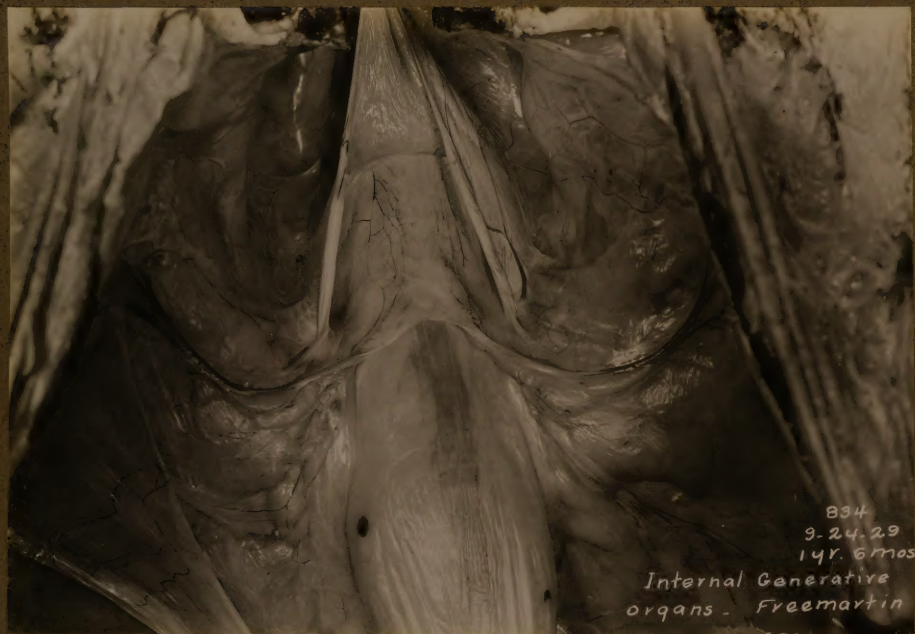
834
9-11-29
1 yr. 6 mos
External Genitals
Freemartin

14754



834
9-11-29
1 yr. 6 mos.
Udder
Freemartin

14755



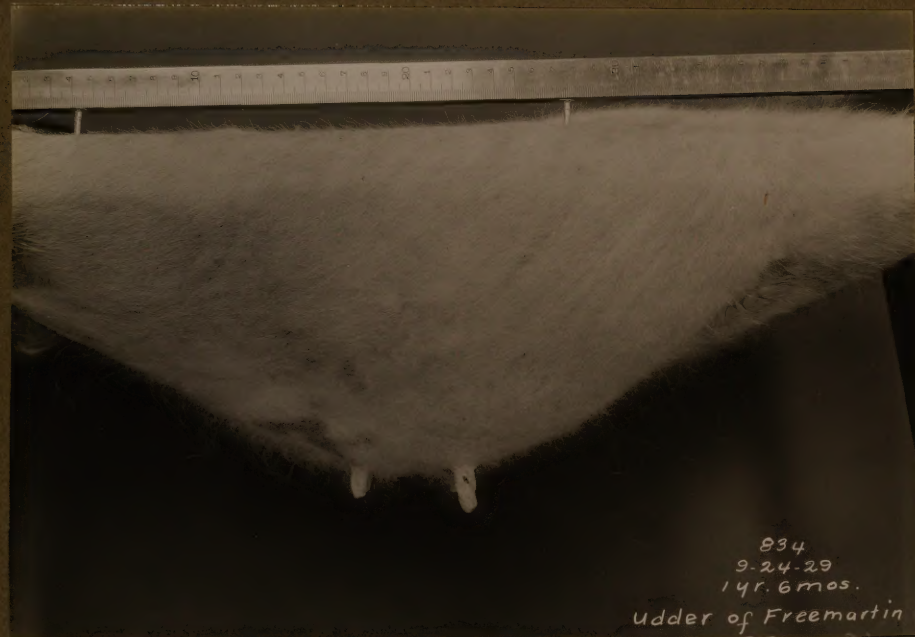
14724



14723



14725



14721

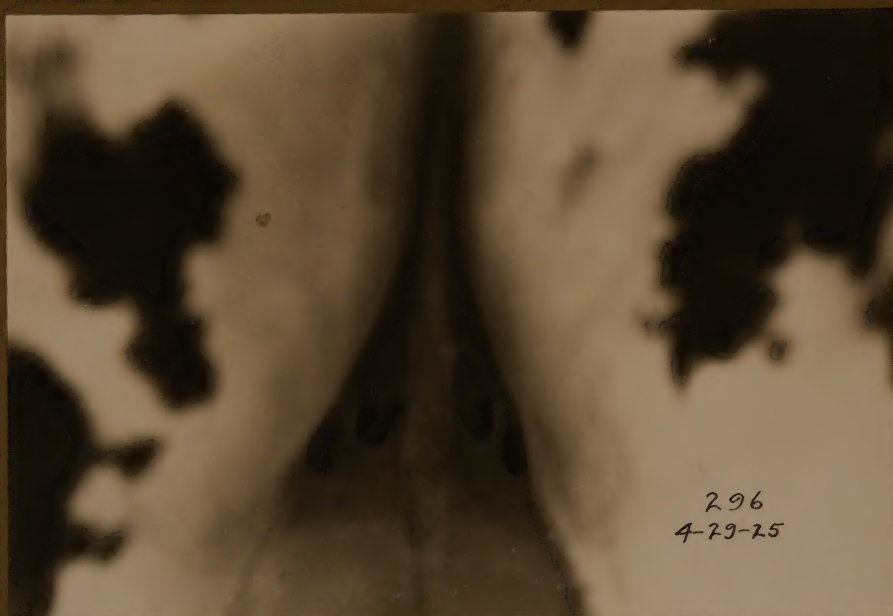


14722



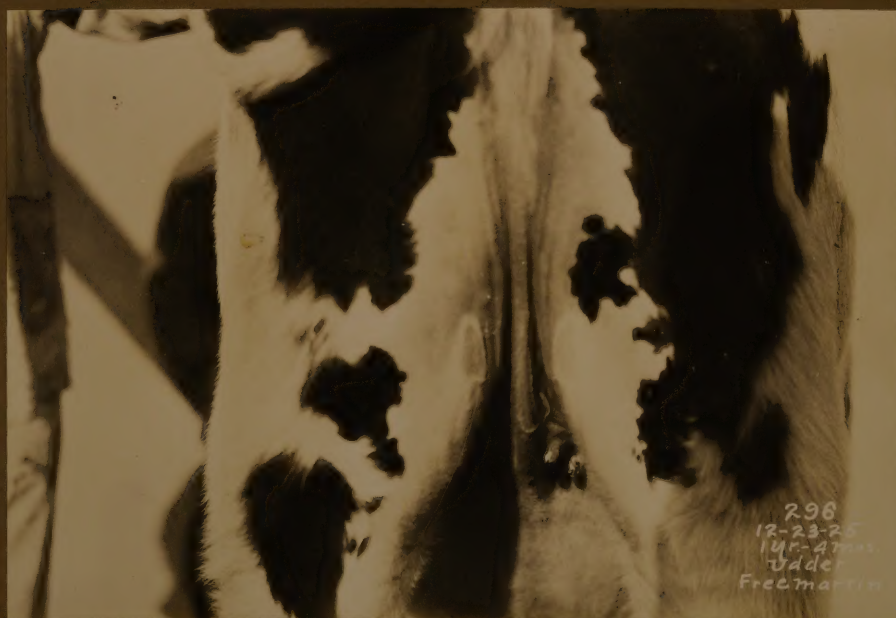
296
4-22-25
9 mos.
Rear

7932



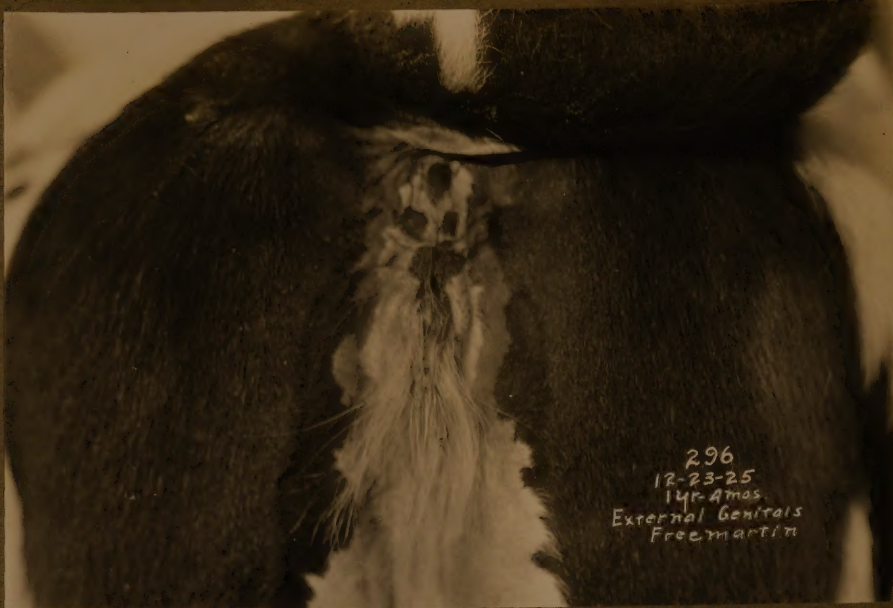
296
4-29-25

7969



298
12-23-25
1 yr. 4 mos.
Udder
Freemartin

7912



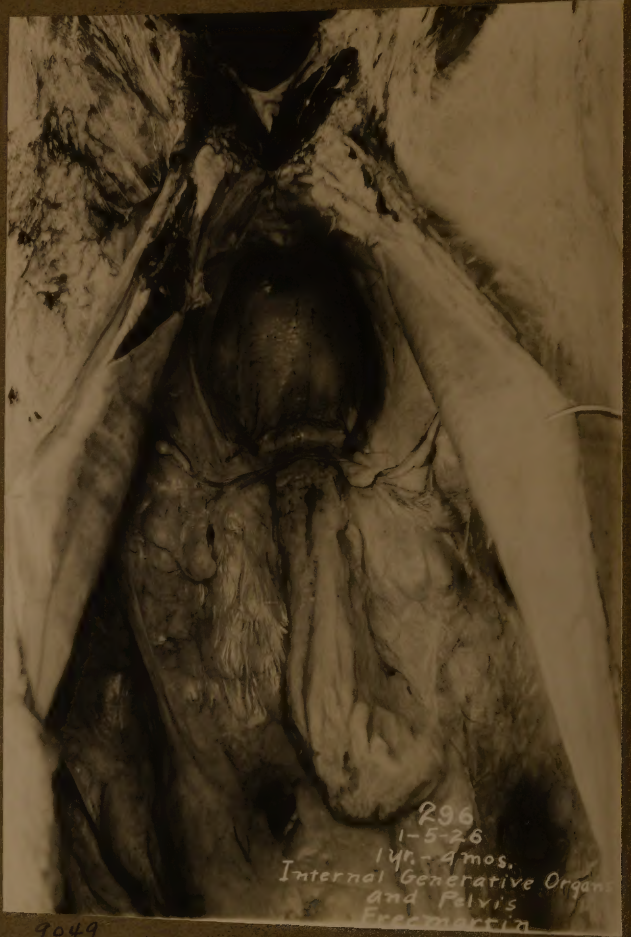
296
12-23-25
1 yr. 4 mos.
External Genitals
Freemartin

9013



296
1-5-26
1 yr. 4 mos.
Internal Generative Organs
Freemartin

9048



296
1-5-26
1 yr. 4 mos.
Internal Generative Organs
and Pelvis
Freemartin

9049



296
1-5-26
1 yr. 4 mos.
UTERUS
Dorsal View
Freemartin

9047



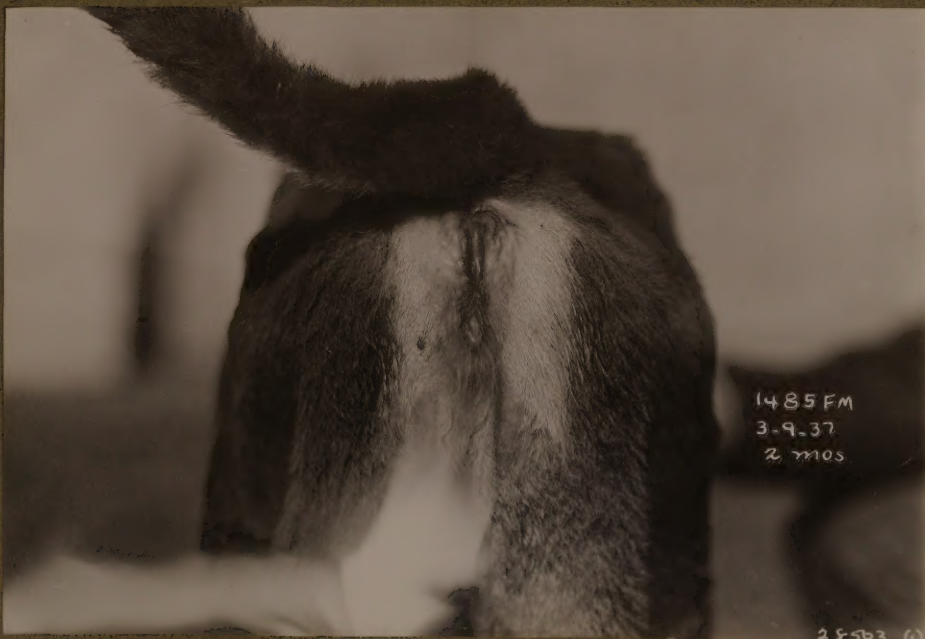
28515



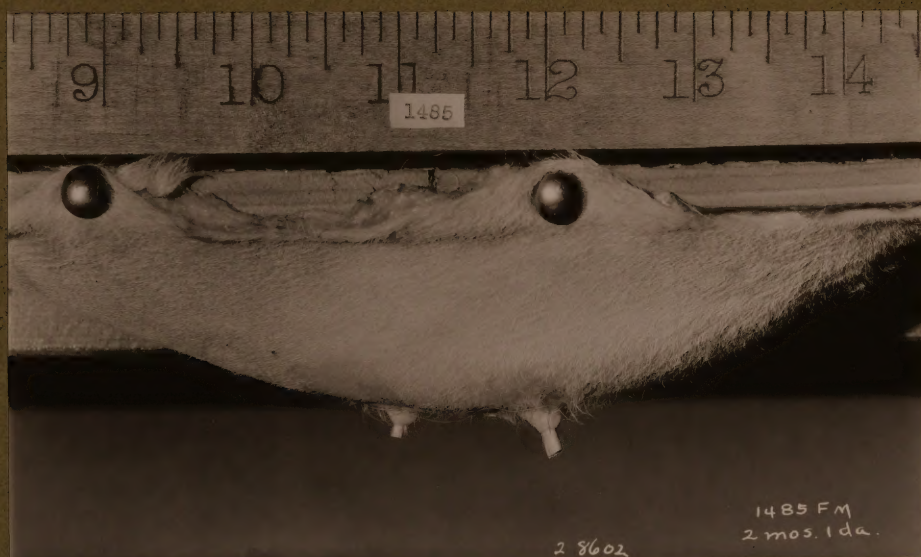
28503(3)



28503(2)

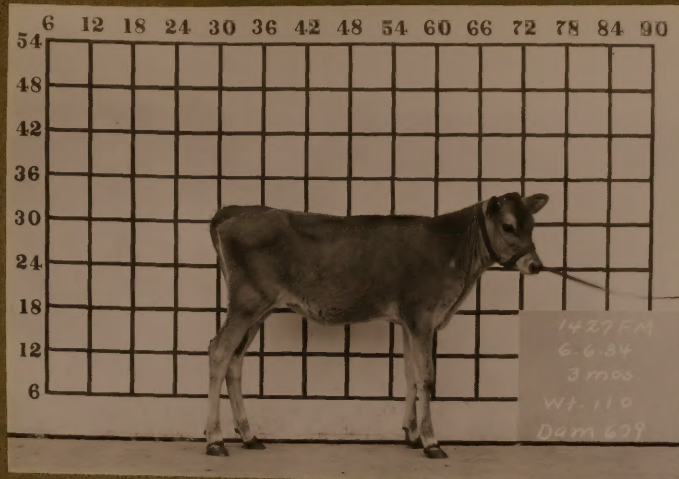


28503(1)

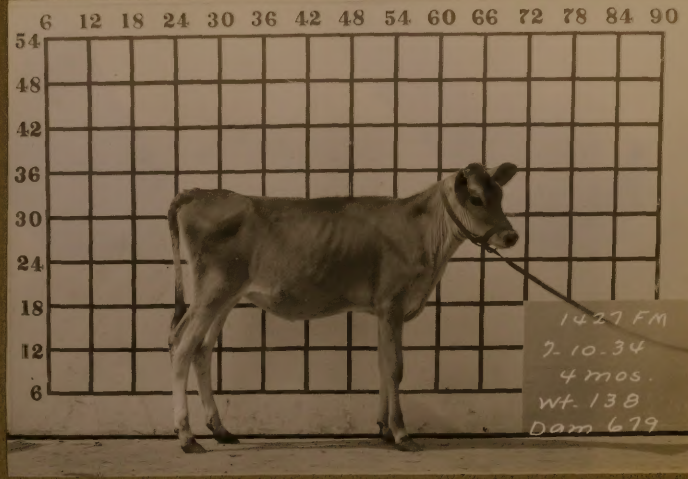




X 5535



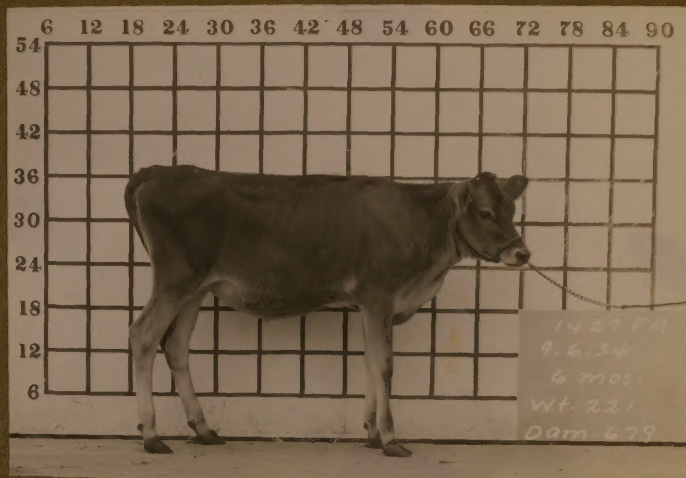
23359



23624



23707



24248



24247



24246



Y4704



Y4703



Y4706



1422 FM
Internal Genitals
6 mos. i. dc. X4705

X4705



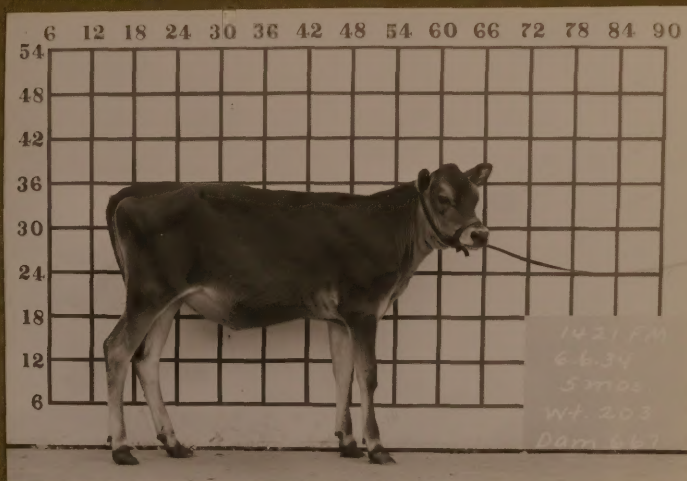
22871



23054



23245



23361



23621



24288



24806



1421 FM
1-8-35
1 yr
wt 455

24937



1421 FM
1-10-35
12 mos.

24805



1421 FM
1-10-35
12 mos.

24804

24804



X 4769



X 4768



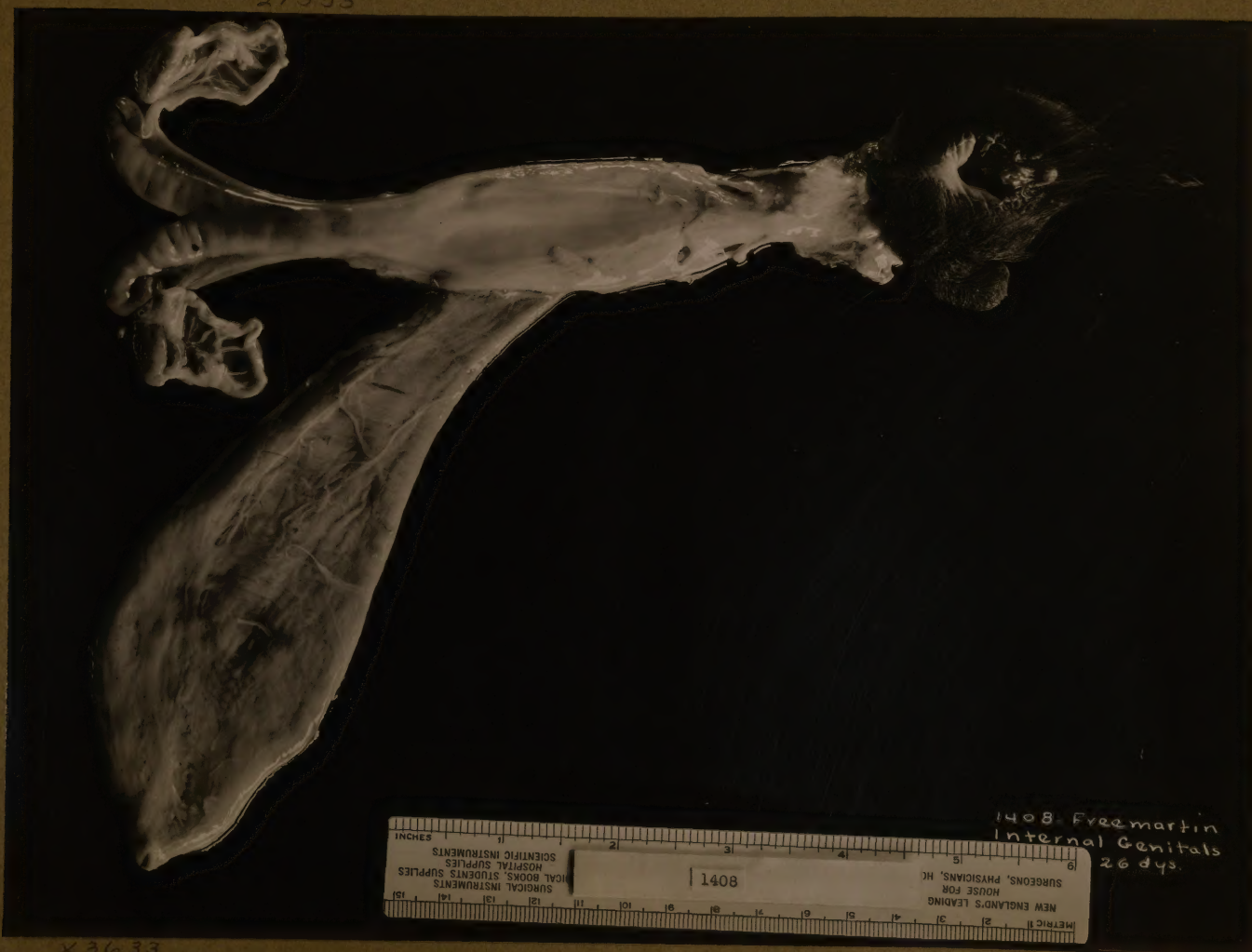
X 4770

1421 FM
12 mos. 6 dys.



X 4771

1421 FM
12 mos. 6 dys.
Internal Genitals
X 4771





1006-Freemartin
4-17-30
18 mos.
Side from below

15600



1006-Freemartin
4-17-30
18 mos.
Rear

15599



1006-Freemartin
4-17-30
18 mos.
Front

15598



1006-Freemartin
4-17-30
18 mos.
Attachments

15597



External Genitals
1006 - Freemartin

15596



External Genitals
1006 - Freemartin

15595



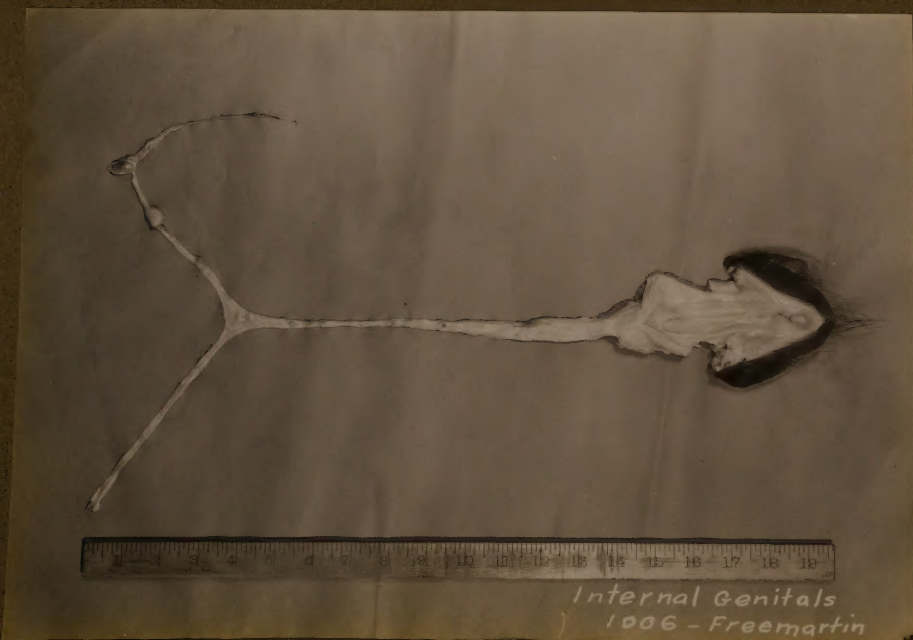
Internal Genitals in position
1006 - Freemartin

15590



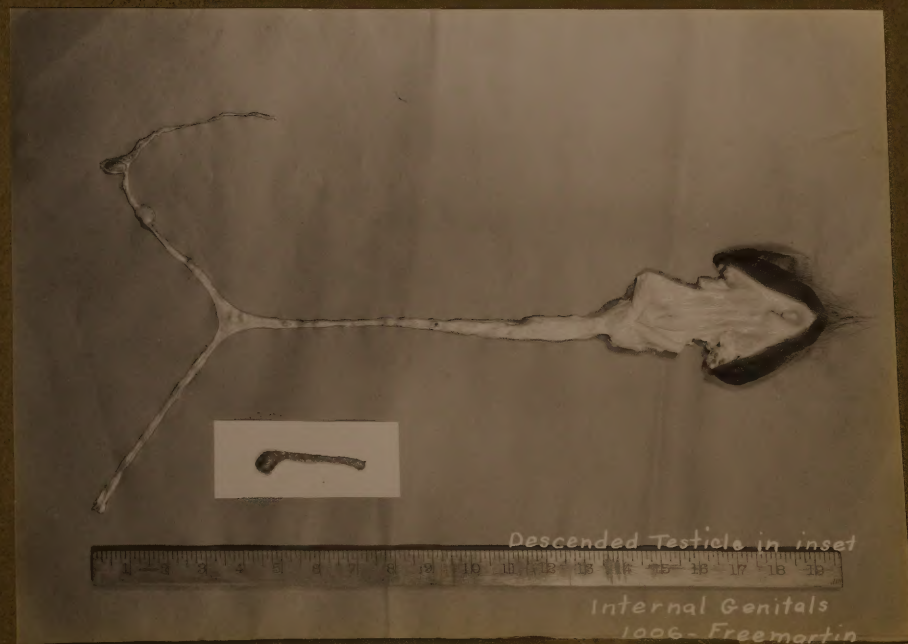
Internal Genitals in position
1006 - Freemartin

15591



Internal Genitals
1006 - Freemartin

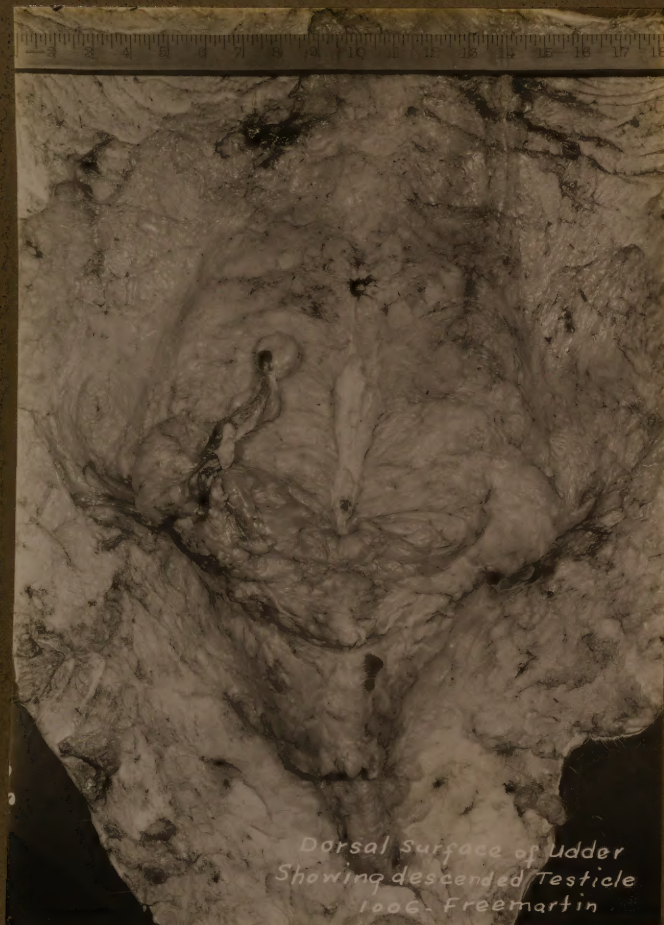
15601



Descended Testicle in inset

Internal Genitals
1006 - Freemartin

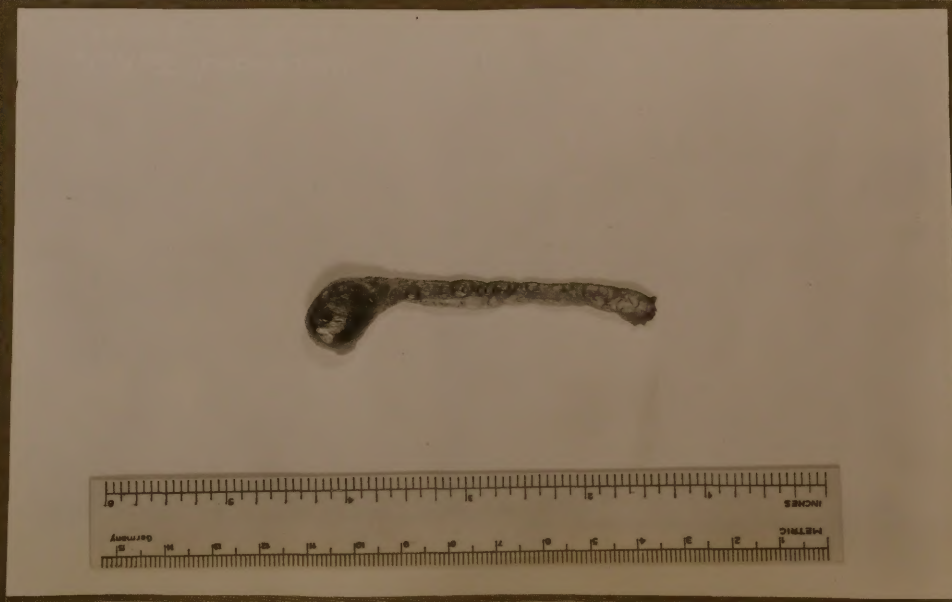
15594



15592



15593





12530



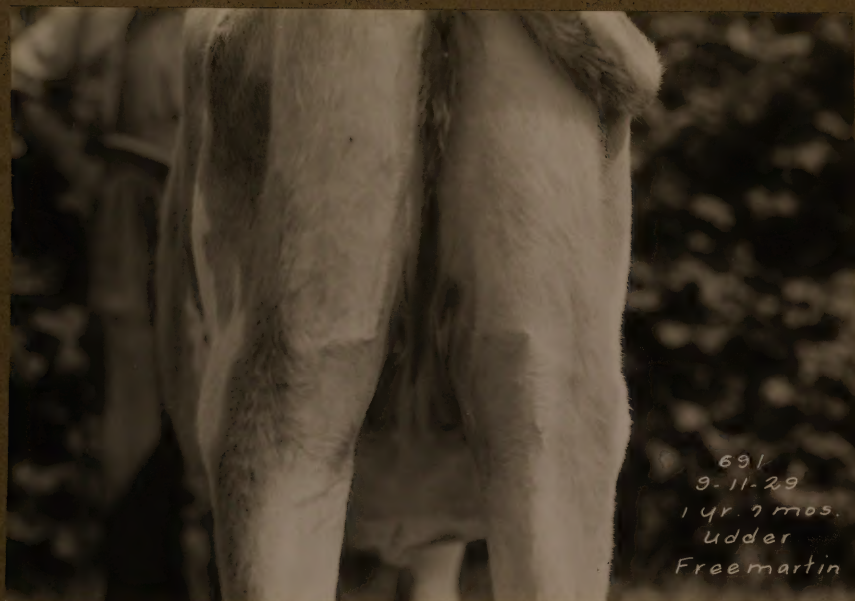
12528



12531



12529



691
9-11-29
1 yr. 7 mos.
Udder
Freemartin

14756



691
9-13-29
1 yr. 7 mos.
Udder of Freemartin

14727



691
9-13-29
1 yr. 7 mos.

Udder of Freemartin
Median Surface - Showing
"Rudimentary" Male Generatives

14728



691
9-11-29
1 yr. 7 mos.
External Genitals
Freemartin

14753



691
Freemartin
3-20-29
1 yr. 1 mo.
Udder and Genitals

13788



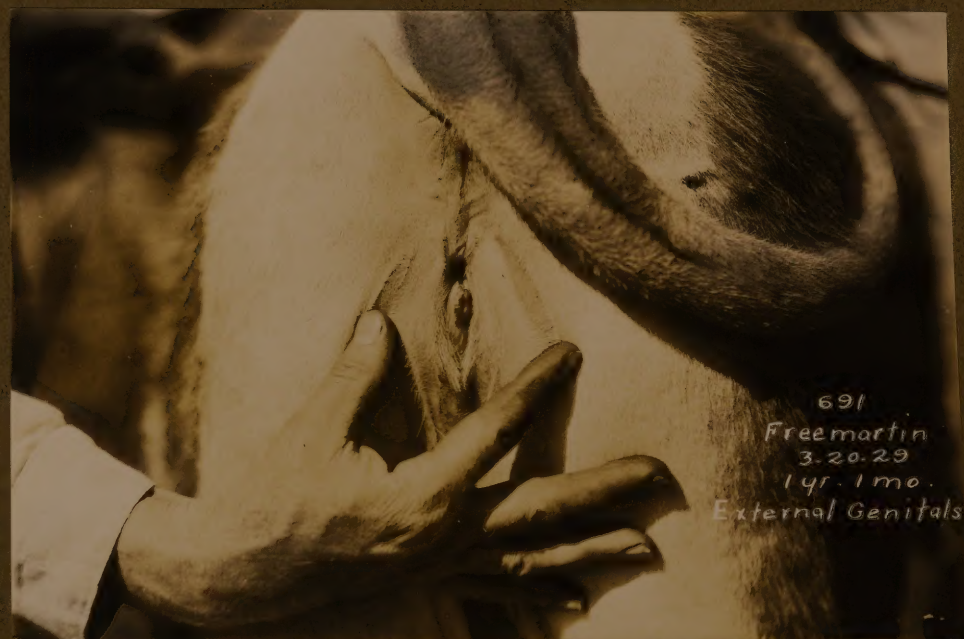
691
Freemartin
3-20-29
1 yr. 1 mo.
External Genitals

13785



691
Freemartin
3-20-29
1 yr. 1 mo.
External Genitals

13787



691
Freemartin
3-20-29
1 yr. 1 mo.
External Genitals

13786



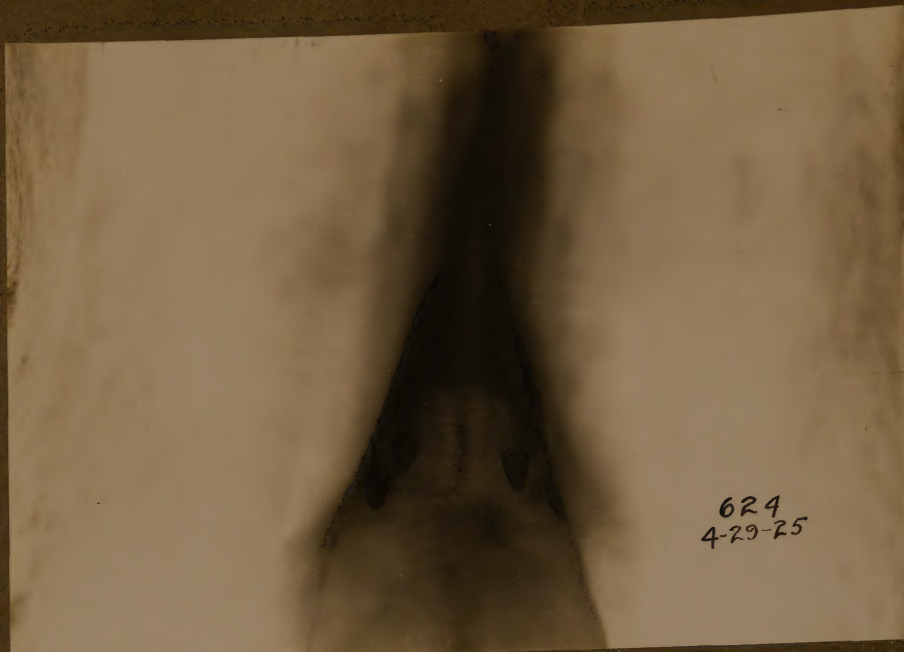
14730



14729



14726



624
4-29-25

7972



624
12-23-25
14r-5 mos.
Udder
Freemartin

9011



624
12-23-25
14r-5 mos.
External Genitals
Freemartin

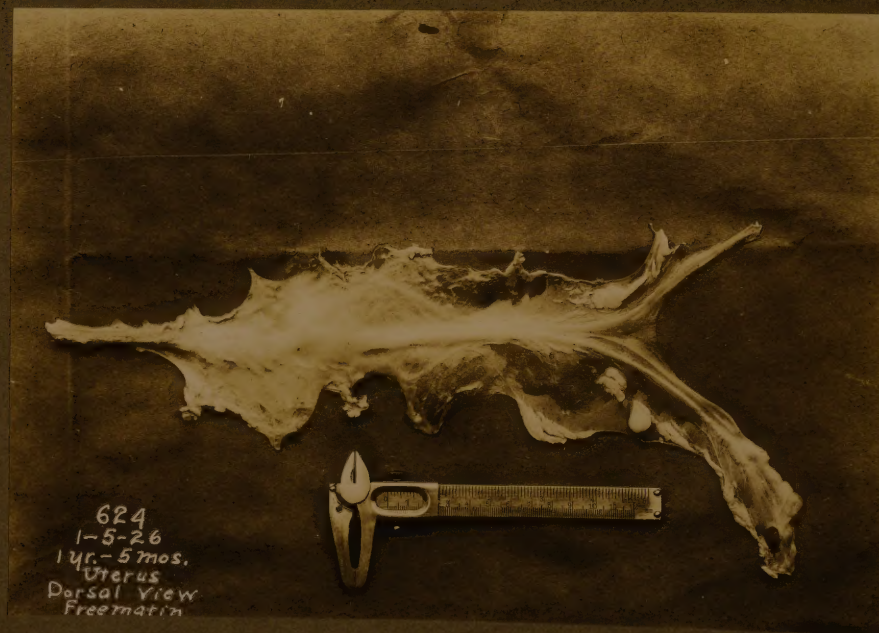
9014



9051



9052



9050



19710



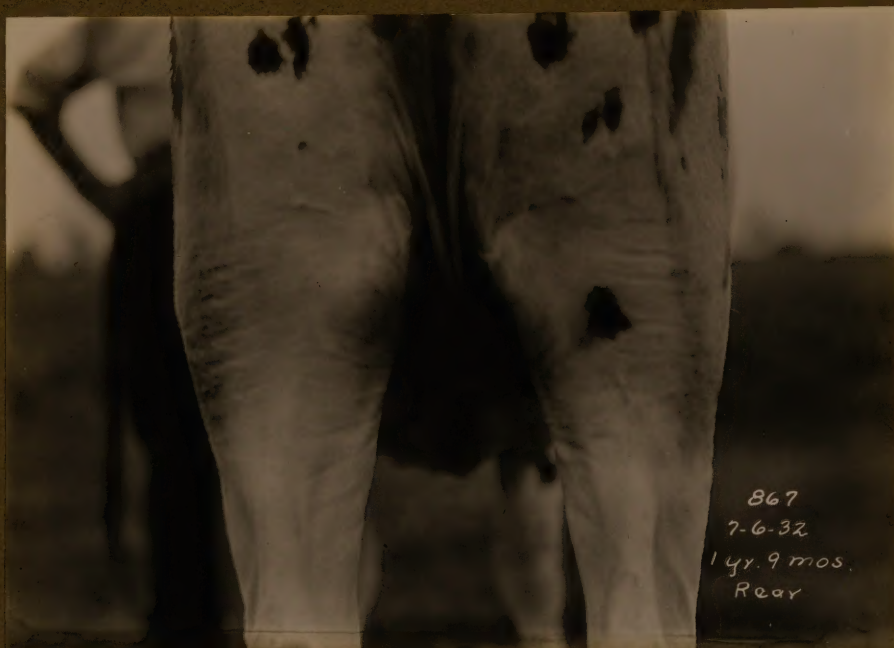
19709



19665



19805



19793



19794

